Robinson+Cole

KENNETH C. BALDWIN

280 Trumbull Street
Hartford, CT 06103-3597
Main (860) 275-8200
Fax (860) 275-8299
kbaldwin@rc.com
Direct (860) 275-8345

Also admitted in Massachusetts
and New York

December 8, 2021

Via Electronic Mail

Melanie A. Bachman, Esq.
Executive Director/Staff Attorney
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

Re: **Notice of Exempt Modification – Facility Modification**
88 Parsonage Hill Road, North Branford (Northford), Connecticut

Dear Attorney Bachman:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently maintains an existing wireless telecommunications facility at the above-referenced property address (the "Property"). The facility consists of antennas and remote radio heads attached to the existing tower and associated equipment on the ground adjacent to the tower. The tower was approved by the Town of North Branford ("Town"). The Siting Council ("Council") approved Cellco's shared use of the tower in March of 2006 (EM-VER-123-007-010-099-060308). A copy of the Town's approval history and the Council's EM-VER-123-007-010-099-060308 approval are included in Attachment 1.

Cellco now intends to modify its facility by removing nine (9) existing antennas and installing six (6) JAHH-65B-R3B antennas on Cellco's existing antenna mounts. Cellco also intends to remove nine (9) remote radio heads ("RRHs") and install six (6) new RRHs behind its antennas. A set of project plans showing Cellco's proposed facility modifications and specifications for Cellco's new antennas and RRHs are included in Attachment 2.

Please accept this letter as notification pursuant to R.C.S.A. § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to the Town's Chief Elected Official and Land Use Officer.

The planned modifications to the facility fall squarely within those activities explicitly provided for in R.C.S.A. § 16-50j-72(b)(2).

1. The proposed modifications will not result in an increase in the height of the existing tower. Cellco's replacement antennas will be installed on Cellco's existing antenna platform.

2. The proposed modifications will not involve any change to ground-mounted equipment and, therefore, will not require the extension of the site boundary.

3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.

4. The installation of Cellco's new antennas will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) safety standard. A cumulative General Power Density table for Cellco's modified facility is included in Attachment 3. The modified facility will not be capable of providing Cellco's 5G wireless service.

5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.

6. According to the attached Structural Analysis ("SA") and Mount Analysis ("MA"), the existing tower, tower foundation and antenna mounts, with certain modifications, can support Cellco's proposed modifications. Copies of the SA and MA are included in Attachment 4.

A copy of the parcel map and Property owner information is included in Attachment 5. A Certificate of Mailing verifying that this filing was sent to municipal officials and the property owner is included in Attachment 6.

For the foregoing reasons, Cellco respectfully submits that the proposed modifications to the above-referenced telecommunications facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2).

Sincerely,

Kenneth C. Baldwin

Enclosures
Copy to:

Michael T. Paulhus, North Branford Town Manager
Eric Knapp, North Branford Town Planner
Jean Szwabowski, KW Ochenkowski and JJ Ochenkowski, Sr.
Alex Tyurin, Verizon Wireless

ATTACHMENT 1

TOWN OF NORTH BRANFORD, CT
ZONING PERMIT

Date of Application: 12/5/97

This permit is hereby submitted in accordance with the requirements of Sections 3.1 and 62 of the Town of North Branford's Zoning Regulations for:

✓ new construction
_____ change of use
_____ sign
_____ other (specify): 300' TOWER
_____ swimming pool
_____ addition
_____ excavation/filling

Zoning District _____
Assessor's Map # 51
Subdivision Name _____
Property Location _____
Lot Frontage 608
Lot # 7
Lot Area 9.31
Lot # _____

Property Owner S. Veronica Ochotorena
Owner's Address 88 Saxonage Hill Rd
Owner's Phone No. 484-9544

Property Use:

_____ single family residence
_____ two family residence
_____ commercial (Specify): _____
_____ industrial (Specify): _____
✓ other (Specify): 300' TOWER (REF. ZBA VARIANCE)

Existing Structures:

Description SINGLE FAMILY DWELLING
Dimensions _____ x _____ x _____ (ht)
Bulk _____
Structures _____
Use _____
Setbacks: Front _____ Rear _____ Side _____
Required Setbacks: From Residence Zone _____ Other _____

Proposed Structures/Signs:

(2) 300 FT. TOWERS
34 x 34 x 300' (ht)
_____ sq. ft.
_____
Front _____ Rear 50 Side 50

Parking Spaces Required: _____

East Shore Health District Approval:	Permit #	_____	Proposed Date:	_____	
Planning & Zoning Approval Required:	Yes	_____	No	Date: _____	App. # _____
Zoning Board of Appeals Approval:	Yes	✓	No	Date: 5/25/68	App. # 68-35
Inland Wetlands & Watercourses Approval:	Yes	_____	No	Date: _____	App. # _____
Flood Plain Encroachment Permit Required:	Yes	_____	No	Date: _____	App. # _____
Streambelt Protection District:	(Sec 33) Yes	_____	No		
Temporary Special Use Permit:	(Sec 43) Yes	_____	No		
Special Use Permit:	(Sec 42) Yes	_____	No		

Conditions of Approval: _____

Driveway Bond: Amount of Bond $ N/A Date Posted: _____

This permit is issued based upon the plot plan submitted. Falsification, by misrepresentation or ommission, or failure to comply with the conditions of this permit shall constitute a violation of the north Branford Zoning Regulations.

Signature of Owner _____
Signature of Agent: _____ Date 12/5/97
Agent's Address 188 Parmelee Hill Rd. Date _____
Agent's Telephone 484-2075

This permit is hereby: _____ Approved _____ Denied

By _____ Date _____
Zoning Enforcement Officer

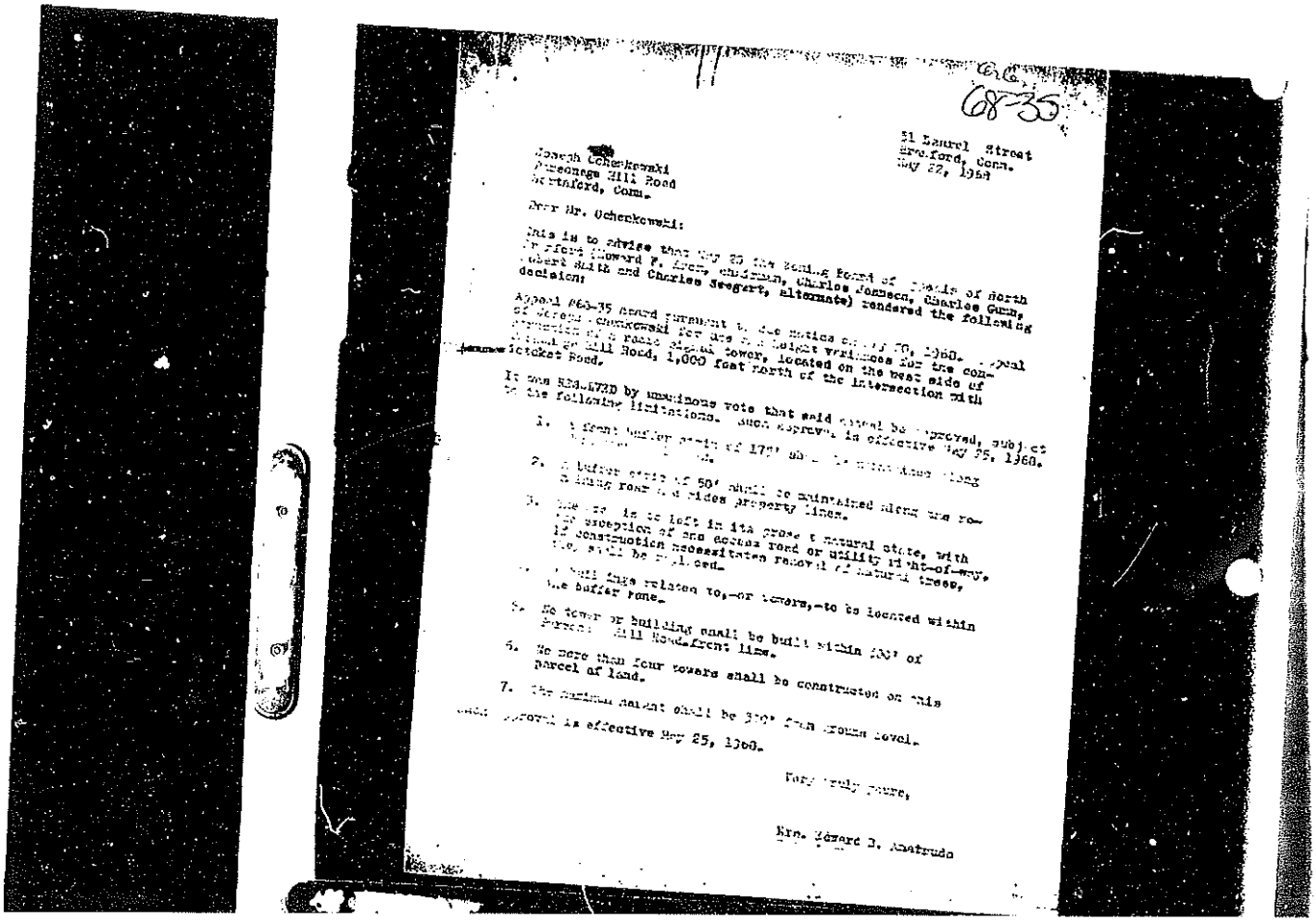
By _____ Date _____
Inland Wetlands Enforcement Officer

By _____ Date 1/2/98 PER ZBA #GB-35 ATTACHED
Planning and Zoning Administrator

By _____ Date _____
Town Engineer

Fee $ _____
Date Paid _____
Permit # _____

LR:dfs
(8/88)



68-35

51 Laurel Street
Branford, Conn.
May 27, 1960

Joseph Ochenkowski
Passonage Hill Road
Northford, Conn.

Dear Mr. Ochenkowski:

This is to advise that [illegible] Board of [illegible] of North Branford, Edward F. Drew, chairman, Charles Jannuca, Charles Gunn, Robert Smith and Charles Swegart, alternate) rendered the following decision:

Appeal #60-35 heard pursuant to due notice on May 20, 1960. [illegible] appeal of Joseph Ochenkowski for area variance for the construction of a radio [illegible] tower, located on the west side of Passonage Hill Road, 1,000 feat north of the intersection with Pickett Road.

It was RESOLVED by unanimous vote that said appeal be approved, subject to the following limitations. Such approval is effective May 25, 1960.

1. A front [illegible] of 175' shall be maintained [illegible]
2. A buffer strip of 50' shall be maintained along the [illegible] along road and side property lines.
3. [illegible] is to be left in its present natural state, with the exception of any access road or utility right-of-way. If construction necessitates removal of natural trees, the same shall be replaced.
4. [illegible] shall [illegible] related to,—or towers,—to be located within the buffer zone.
5. No tower or building shall be built within 200' of present Hill Road[illegible]front line.
6. No more than four towers shall be construction on this parcel of land.
7. The maximum height shall be 370' from ground level.

[illegible] approval is effective May 25, 1960.

Very truly yours,

Mrs. Edward J. Mastruda

TOWN OF NORTH BRANFORD, CT
ZONING PERMIT

Date of Application: _____

This permit is hereby submitted in accordance with the requirements of Sections 3.1 and 62 of the Town of North Branford's Zoning Regulations for:

_____ new construction
_____ change of use
_____ sign
_____ other (specify): _____
_____ swimming pool
__X__ addition
_____ excavation/filling

Zoning District R-40
Assessor's Map # 51
Subdivision Name _____
Property Location 88 Parsonage Hill Rd.
Lot Frontage _____
Lot # 7
Lot Area _____
Lot # _____

Property Owner Swiecbowski Jean & Ochenkowski Joseph Jr.
Owner's Address 84 Parsonage Hill Rd. Northford, CT 06472
Owner's Phone No. _____

Property Use:

_____ single family residence
_____ two family residence
__X__ commercial (Specify): Wireless Communication facility
_____ industrial (Specify): _____
_____ other (Specify): _____

Existing Structures:

Description Wireless Communication
Dimensions 7' x 16' x 170' (ht)
Bulk _____
Structures _____
Use wireless communication
Setbacks: Front ____ Rear ____ Side ____
Required Setbacks: From Residence Zone _____ Other _____

Proposed Structures/Signs:

Wireless Communication Tower
7 x 112' x 170' (ht)
_____ sq. ft.
_____
_____
Front ____ Rear ____ Side ____

Parking Spaces Required: 0
Proposed 0

East Shore Health District Approval:	Permit #	_____		Date:		
Planning & Zoning Approved Required:	Yes	_____	No ✓	Date:	App. #	
Zoning Board of Appeals Approval:	Yes	_____	No ✓	Date:	App. #	
Inland Wetlands & Watercourses Approval:	Yes	_____	No ✓	Date:	App. #	
Flood Plain Encroachment Permit Required:	Yes	_____	No _____	Date:	App. #	
Streambelt Protection District: (Sec 33)	Yes	_____	No _____			
Temporary Special Use Permit: (Sec 43)	Yes	_____	No _____			
Special Use Permit: (Sec 42)	Yes	_____	No _____			

CT. Siting Council Approval letter dated 7-18-02

Conditions of Approval: _____

Driveway Bond: Amount of Bond $ _____ Date Posted: _____

This permit is issued based upon the plot plan submitted. Falsification, by misrepresentation or ommission, or failure to comply with the conditions of this permit shall constitute a violation of the north Branford Zoning Regulations.

Signature of Owner _____ Date _____
Signature of Agent _____ Date _____
Agent's Address _____
Agent's Telephone _____

This permit is hereby: ✓ Approved _____ Denied

By _____ Date 10-17-02
Zoning Enforcement Officer

By _____ Date 10-25-02
Inland Wetlands Enforcement Officer

By _____ Date 10-25-02
Planning and Zoning Administrator N/A

By _____ Date _____
Town Engineer

Fee $ _____
Date Paid _____
Permit # _____

LR:dfs
(8/88)

TOWN OF NORTH BRANFORD

BUILDING DEPARTMENT
1599 FOXON ROAD
PO BOX 287
NORTH BRANFORD, CT 06471
TELEPHONE: (203) 315-6008
FAX: (203) 315-6025

CERTIFICATE OF CODE COMPLIANCE

NO. 1853

DATE: January 9, 2003

THIS IS TO CERTIFY THAT WORK SPECIFIED BY BUILDING PERMIT # 7043 ISSUED ON 10/30/2002

LOCATED AT 88 Parsonage Hill Road FOR Wireless Communication Facility IS FOUND TO SUBSTANTIALLY COMPLY WITH THE PROVISIONS OF THE BUILDING AND/OR ZONING ORDINANCES OF THE TOWN OF NORTH BRANFORD AND HAS BEEN COMPLETED TO THE SATISFACTION OF THE NORTH BRANFORD BUILDING DEPARTMENT.

A) USE GROUP B IN ACCORDANCE WITH PROVISIONS OF ARTICLE 3

B) FIRE GRADING 2C AS DEFINED IN ARTICLE 4 AND TABLE 401

SPECIAL STIPULATIONS OR CONDITIONS: Per 1999 Connecticut State Building Code.

Joseph Di Natale
INSPECTED BY

Robert F. Linsley
BUILDING OFFICIAL

DFS

CC: ASSESSOR'S OFFICE
FILES

North Branford Planning & Zoning Commission
North Branford, Connecticut

4429

ZONING PERMIT

This is to certify that the wireless communication facility

located at 83 Parsonage Hill Road

owned by Jean Szwabowski

has been examined by me as required by the ZONING REGULATION OF THE TOWN OF NORTH BRANFORD, CONNECTICUT and I am satisfied that the same complies with the requirements of said ZONING REGULATIONS and authorize commencement of building construction and site development.

Signed _____
Zoning Enforcement Officer

Date 1-1-03

Signed _____
Planning and Zoning Administrator

Date _____

NOTES:

1. This is not a Building Permit
2. Any Zoning Permit that involves approval of a SITE DEVELOPMENT PLAN or SPECIAL USE PERMIT by the Commission, or other action of the commission, shall be countersigned by the Planning and Zoning Administrator.

4429

CERTIFICATE OF ZONING COMPLIANCE/NONCONFORMITY

This is to certify that the wireless communication facility

located at 88 Parsonage Hill Road

owned by Jean Szwabowski

has been examined by me as required by the ZONING REGULATIONS OF THE TOWN OF NORTH BRANFORD, CONNECTICUT and I am satisfied that the same complies with the requirements of said ZONING REGULATIONS and may be used and/or occupied because -

____ It conforms to the Zoning Regulations

____ It is a lawfully existing nonconforming parcel, use, building or other structure which may be continued in accordance with the provisions of Paragraphs 5.6.1 - 5.6.5 and Section 5 of the ZONING REGULATIONS; or

____ It is in the process of improvement and completion in accordance with an approved APPLICATION FOR A ZONING PERMIT and is entitled to a temporary PERMIT in accordance with Paragraph 62.7.5 PERMIT terminating on _____

____ Other _____

Signed _____
Zoning Enforcement Officer

Date 1-9-03

Signed _____
Planning and Zoning Administrator

Date _____

Notes:

1. This is not a Certificate of Occupancy

2. Any Certificate that pertains to a use, building structure or site development for which a SITE DEVELOPMENT PLAN or SPECIAL USE PERMIT has been approved by the Commission shall be countersigned by the Planning and Zoning Administrator

STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@po.state.ct.us
www.ct.gov/csc

March 24, 2006

Kenneth C. Baldwin, Esq.
Robinson & Cole LLP
280 Trumbull Street
Hartford, CT 06103-3597

RE: **EM-VER-123-007-010-099-060308** - Cellco Partnership d/b/a Verizon Wireless notice of intent to modify existing telecommunications facilities located at 165 Huntington Road, Scotland; 1657 Wilbur Cross Parkway, Berlin; 310 Watertown Road, Bethlehem; and 88 Parsonage Hill Road, Northford (North Branford), Connecticut.

Dear Attorney Baldwin:

At a public meeting held on March 22, 2006, the Connecticut Siting Council (Council) acknowledged your notice to modify these existing telecommunications facilities, pursuant to Section 16-50j-73 of the Regulations of Connecticut State Agencies.

The proposed modifications are to be implemented as specified here and in your notice dated March 8, 2006, including the placement of all necessary equipment and shelters within the tower compounds. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to existing facility sites that would not increase tower heights, extend the boundaries of the tower sites, increase noise levels at the tower site boundaries by six decibels, and increase the total radio frequencies electromagnetic radiation power densities measured at the tower site boundaries to or above the standard adopted by the State Department of Environmental Protection pursuant to General Statutes § 22a-162. These facilities have also been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on these towers.

This decision is under the exclusive jurisdiction of the Council. Please be advised that the validity of this action shall expire one year from the date of this letter. Any additional change to any of these facilities will require explicit notice to this agency pursuant to Regulations of Connecticut State Agencies Section 16-50j-73. Such notice shall include all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65. Any deviation from this format may result in the Council implementing enforcement proceedings pursuant to General Statutes § 16-50u including, without limitation, imposition of expenses resulting from such failure and of civil penalties in an amount not less than one thousand dollars per day for each day of construction or operation in material violation.

Thank you for your attention and cooperation.

Very truly yours,

Pamela B. Katz, P.E.
Chairman

PBK/laf

See Attached List.

I:\siting\forms\exmod\emdcltr.doc

CSC
CONNECTICUT SITING COUNCIL

List Attachment.

c: The Honorable Adam P. Salina, Mayor, Town of Berlin
Hellyn Riggins, Town Planner, Town of Berlin
The Honorable Leo S. Bulvanoski, First Selectman, Town of Bethlehem
Jeffrey Hamel, Chairman, Planning and Zoning, Town of Bethlehem
The Honorable Andrew Esposito III, Mayor, Town of North Branford
Carol Zeeb, Town Planner, Town of North Branford
The Honorable Elizabeth A. Wilson, First Selectman, Town of Scotland
Carl S. Fontneau, Town Planner, Town of Scotland
Berlin Fire Department
Jean Szwabowski, Ochenknowski Towers LLC
Sheila R. Becker, Regional Director of Compliance, SBA, Inc.
Christopher B. Fisher, Esq., Cuddy & Feder LLP
Thomas J. Regan, Esq., Brown Rudnick Berlack Israels LLP
Michele G. Briggs, New Cingular Wireless PCS, LLC
Christine Farrell, T-Mobile, Inc.
Thomas F. Flynn III, Nextel Communications, Inc.

ATTACHMENT 2

VICINITY MAP

SCALE: N.T.S.

N

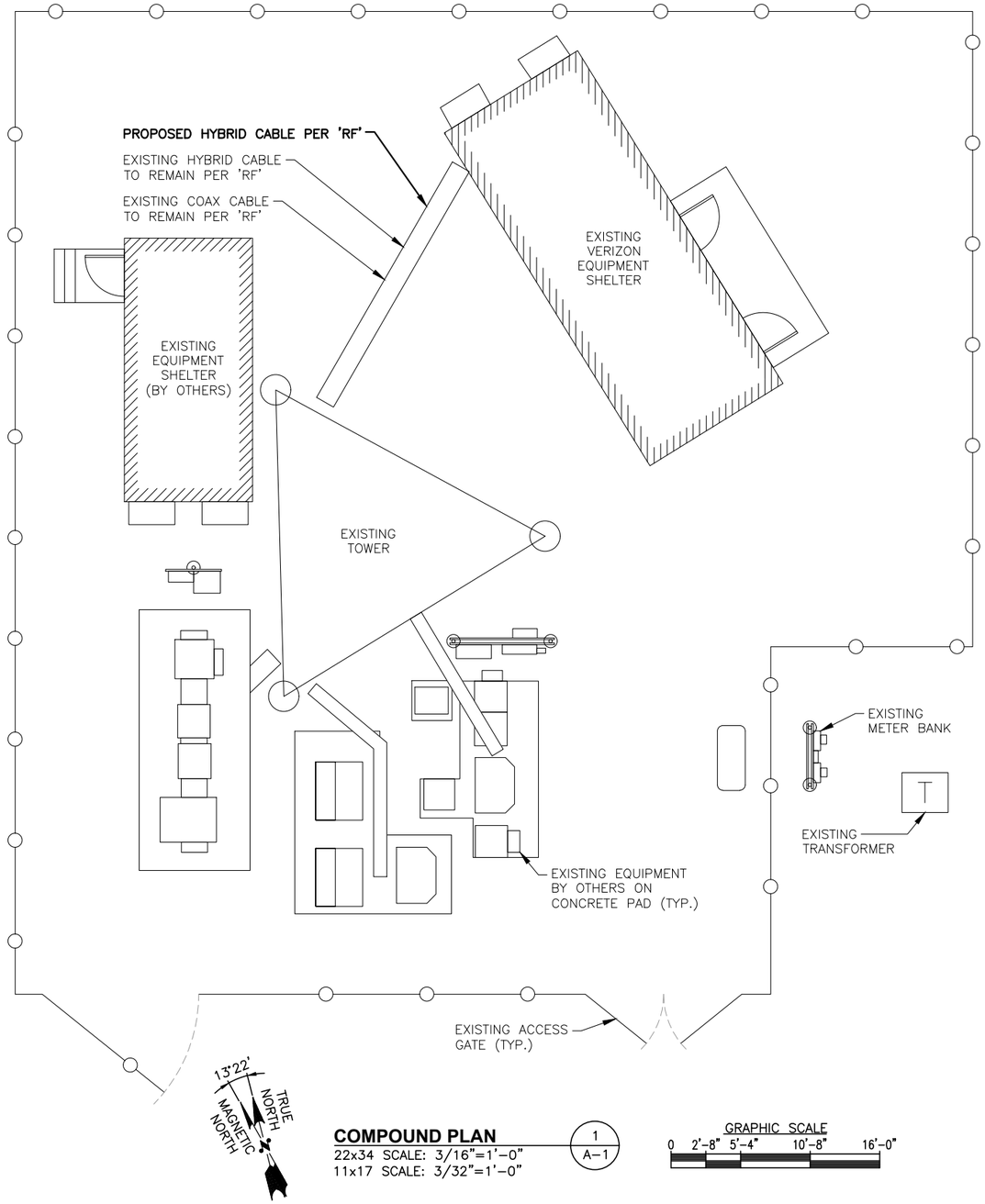
APPROXIMATE COORDINATES:	LATITUDE:	N41° 22' 04.99"
	LONGITUDE:	W72° 48' 37.99"

NOTE:

AN ANALYSIS FOR THE CAPACITY OF THE EXISTING ANTENNA MOUNT TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY: HUDSON DESIGN GROUP, LLC.
DATED: AUGUST 18, 2021 (REV.4)

NOTE:

AN ANALYSIS OF THE CAPACITY OF THE EXISTING STRUCTURE TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY: CENTEK ENGINEERING.
DATED: AUGUST 30, 2021



COMPOUND PLAN (1 / A-1)
22x34 SCALE: 3/16"=1'-0"
11x17 SCALE: 3/32"=1'-0"

GRAPHIC SCALE
0 2'-8" 5'-4" 10'-8" 16'-0"

FIELD INSPECTION DATE: 10-30-2018

SCOPE

1. EXISTING (9) ANTENNAS TO BE REMOVED PER 'RF', EXISTING (3) ANTENNAS TO REMAIN PER 'RF', INSTALL (6) ANTENNAS PER 'RF'.
2. INSTALL (3) SIDE-BY-SIDE MOUNT PER 'RF'.
3. EXISTING (3) DIPLEXERS TO BE REMOVED PER 'RF', INSTALL (3) DIPLEXERS PER 'RF'.
4. EXISTING (12) RRHS TO BE REMOVED PER 'RF', INSTALL (6) RRHS PER 'RF'.
5. EXISTING (1) JUNCTION BOX TO REMAIN PER 'RF', INSTALL (1) JUNCTION BOX PER 'RF'.
6. EXISTING (1) HYBRID CABLE TO REMAIN PER 'RF', INSTALL (1) HYBRID CABLE PER 'RF'.
7. EXISTING (12) COAX CABLES TO REMAIN PER 'RF'.
8. ALL REPLACEMENT ANTENNAS TO MATCH EXISTING CONDITION & HEIGHTS.
9. RECONFIGURE/RELOCATE EXISTING ANTENNA MOUNTS AS NECESSARY TO ACCOMMODATE HORIZONTAL SEPARATION, PROPOSED AZIMUTHS, AND ANTENNAS CONFIGURATION.

NEW ANTENNA CONFIGURATION

NOTE TO GENERAL CONTRACTOR:

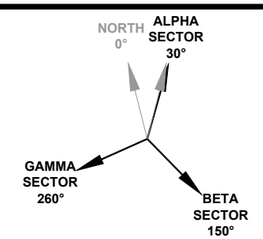
'RF' DESIGN AND EQUIPMENT IS BASED UPON **RFDS ISSUED BY VZW DATED: APRIL 22, 2021 REVISION #3.**

THE CONTRACTOR OF RECORD SHALL CONTACT VZW PRIOR TO ANY AND ALL ORDERING/PURCHASING/INSTALLATION OF EQUIPMENT TO VERIFY THAT THE 'RF' LISTED IN THE DRAWING SET IS CURRENT AND UP TO DATE.

NOTES

1. NORTH SHOWN AS APPROXIMATE.
2. SOME EXISTING & PROPOSED INFORMATION NOT SHOWN FOR CLARITY.
3. ANTENNAS WILL BE CAMOUFLAGED WITH 3M WRAP OR SHERWIN-WILLIAMS PRO INDUSTRIAL DTM ACRYLIC PAINT, AS NEEDED, PER VERIZON WIRELESS AND BUILDING OWNER'S APPROVAL.
4. PRIOR TO COMMENCEMENT OF ANY WORK, PROPOSED ANTENNA INSTALLATION IS PURSUANT TO FINDINGS DICTATED IN STRUCTURAL ANALYSIS. STRUCTURAL ANALYSIS TO VERIFY CAPACITY OF EXISTING STRUCTURE TO ENSURE STRUCTURAL INTEGRITY FOLLOWING INSTALLATION OF PROPOSED ANTENNAS, COAX CABLES AND REQUIRED HARDWARE. COPY OF STRUCTURAL ANALYSIS TO BE SENT TO DESIGN ENGINEER.
5. CONTRACTOR SHALL FIELD VERIFY SCOPE OF WORK, VERIZON WIRELESS ANTENNA MOUNT LOCATION AND ANTENNAS TO BE INSTALLED.
6. CONTRACTOR SHALL NOTIFY ENGINEERS IF FIELD CONDITIONS DIFFER FROM DESIGN.
7. RAD CENTERS MEASURED IN THE FIELD WITH LASER BY HDG. RAD CENTERS MAY NOT MATCH RF ANTENNA DESIGN SHEET.

ANTENNA ORIENTATION



PREPARED FOR:

verizon

118 FLANDERS ROAD
WESTBOROUGH, MA 01581

HUDSON Design Group LLC
45 BEECHWOOD DRIVE
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

STATE OF CONNECTICUT
DANIEL P. HAMM
No. 24178
LICENSED PROFESSIONAL ENGINEER

CONSTRUCTION DRAWINGS ARE VALID FOR SIX MONTHS AFTER ENGINEER OF RECORD'S STAMPED AND SIGNED SUBMITTAL DATE LISTED HEREIN

CHECKED BY: JX

APPROVED BY: DPH

SUBMITTALS

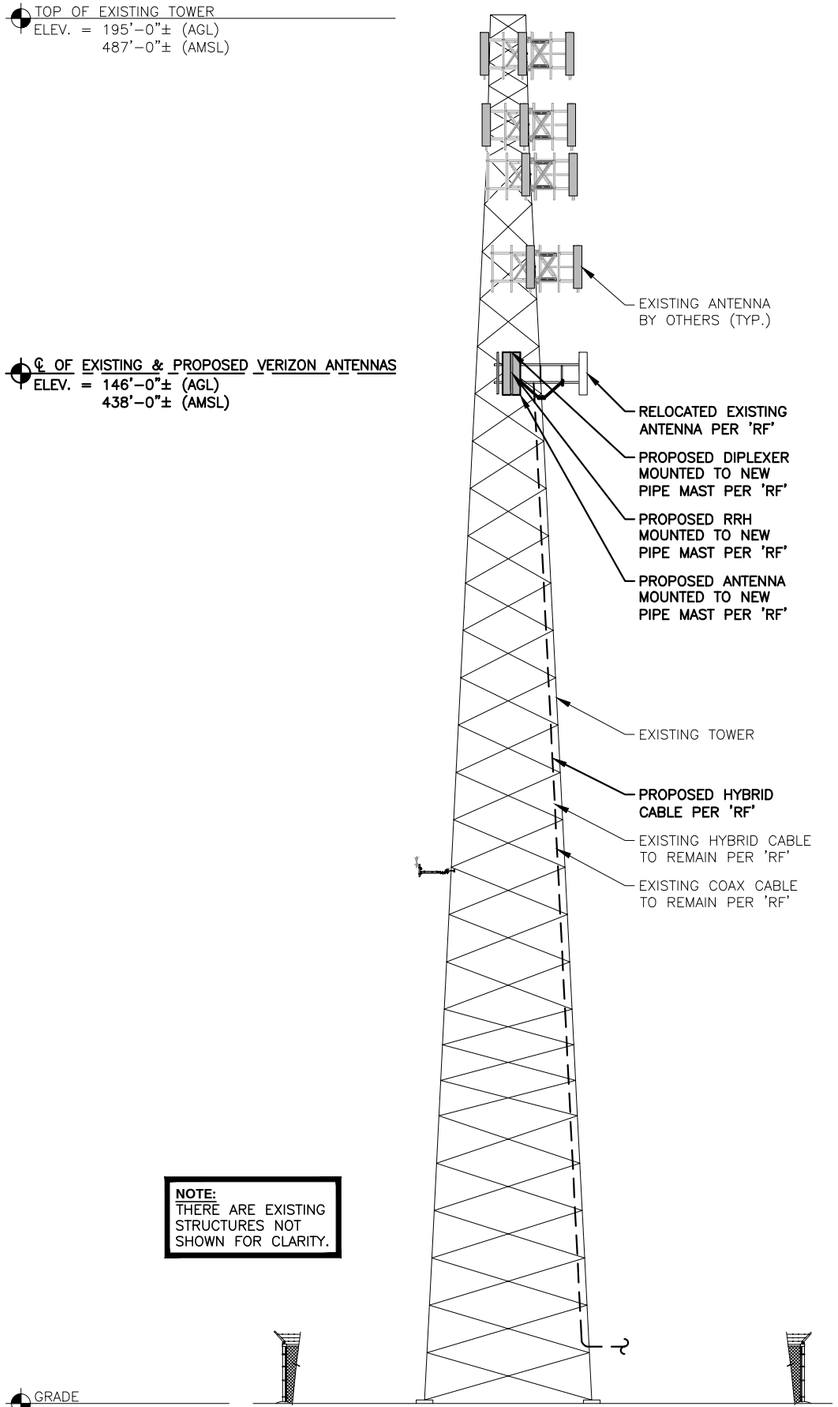
REV.	DATE	DESCRIPTION	BY
6	09/23/21	REVISED PER NEW RFDS	SF
5	12/17/18	REVISED PER COMMENTS	KAM
4	12/12/18	REVISED PER COMMENTS	KAM
3	07/20/18	REVISED PER COMMENTS	JS
2	07/11/18	REVISED PER COMMENTS	KAM
1	06/27/18	REVISED PER COMMENTS	KAM
0	01/25/18	ISSUED FOR REVIEW	SLY

SITE NAME:
NORTHFORD CT

SITE ADDRESS:
88 PARSONAGE ROAD
NORTHFORD, CT 06472

SHEET TITLE
COMPOUND PLAN

SHEET NUMBER
A-1



NOTE:
THERE ARE EXISTING STRUCTURES NOT SHOWN FOR CLARITY.

ELEVATION
1 / A-2
22x34 SCALE: 3/32"=1'-0"
11x17 SCALE: 3/64"=1'-0"

GRAPHIC SCALE
0 5'-4" 10'-8" 21'-4" 32'-0"

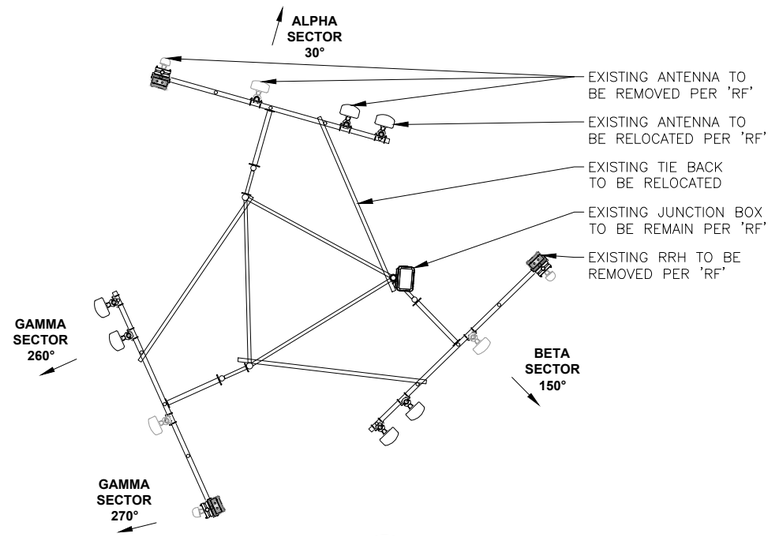
NOTE:
AN ANALYSIS OF THE CAPACITY OF THE EXISTING STRUCTURE TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY: CENTEK ENGINEERING.
DATED: AUGUST 30, 2021

NOTE:
AN ANALYSIS FOR THE CAPACITY OF THE EXISTING ANTENNA MOUNT TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY: HUDSON DESIGN GROUP, LLC.
DATED: AUGUST 18, 2021 (REV.4)

PROPOSED ANTENNA INFORMATION

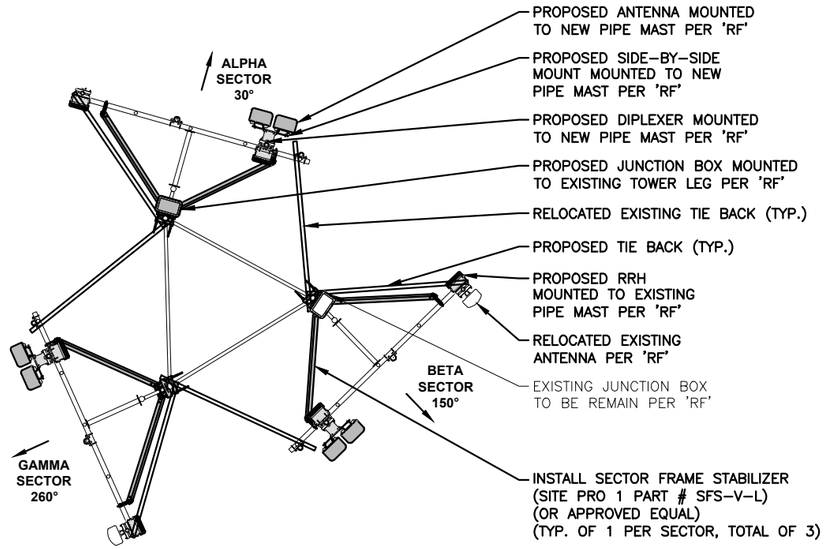
SECTOR	STATUS	AZIMUTH	CABLE LENGTH
ALPHA	PROPOSED	30°	235'
BETA	PROPOSED	150°	235'
GAMMA	PROPOSED	260°	235'

NOTE: CABLE LENGTH = EXACT LENGTH PLUS 25'.
CONTRACTOR TO VERIFY CABLE LENGTH PRIOR TO ORDERING.



EXISTING ANTENNA PLAN
2 / A-2
22x34 SCALE: 1/4"=1'-0"
11x17 SCALE: 1/8"=1'-0"

GRAPHIC SCALE
0 2 4 8 12 FEET



PROPOSED ANTENNA PLAN
3 / A-2
22x34 SCALE: 1/4"=1'-0"
11x17 SCALE: 1/8"=1'-0"

GRAPHIC SCALE
0 2 4 8 12 FEET

PREPARED FOR:
verizon
118 FLANDERS ROAD
WESTBOROUGH, MA 01581

HUDSON Design Group LLC
45 BEECHWOOD DRIVE
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

STATE OF CONNECTICUT
DANIEL P. HAMM
No. 24178
LICENSED PROFESSIONAL ENGINEER

CONSTRUCTION DRAWINGS ARE VALID FOR SIX MONTHS AFTER ENGINEER OF RECORD'S STAMPED AND SIGNED SUBMITTAL DATE LISTED HEREIN

CHECKED BY: JX

APPROVED BY: DPH

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
6	09/23/21	REVISED PER NEW RFDS	SF
5	12/17/18	REVISED PER COMMENTS	KAM
4	12/12/18	REVISED PER COMMENTS	KAM
3	07/20/18	REVISED PER COMMENTS	JS
2	07/11/18	REVISED PER COMMENTS	KAM
1	06/27/18	REVISED PER COMMENTS	KAM
0	01/25/18	ISSUED FOR REVIEW	SLY

SITE NAME:
NORTHFORD CT

SITE ADDRESS:
88 PARSONAGE ROAD
NORTHFORD, CT 06472

SHEET TITLE
ELEVATION & ANTENNA PLANS

SHEET NUMBER
A-2

STRUCTURAL NOTES:

1. DESIGN REQUIREMENTS ARE PER STATE BUILDING CODE AND APPLICABLE SUPPLEMENTS, INTERNATIONAL BUILDING CODE, EIA/TIA-222-G STRUCTURAL STANDARDS FOR STEEL ANTENNA, TOWERS AND ANTENNA SUPPORTING STRUCTURES.
2. CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS IN THE FIELD PRIOR TO FABRICATION AND ERECTION OF ANY MATERIAL. ANY UNUSUAL CONDITIONS SHALL BE REPORTED TO THE ATTENTION OF THE CONSTRUCTION MANAGER AND ENGINEER OF RECORD.
3. DESIGN AND CONSTRUCTION OF STRUCTURAL STEEL SHALL CONFORM TO THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION "SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS".
4. STRUCTURAL STEEL SHALL CONFORM TO ASTM A992 (Fy=50 ksi), MISCELLANEOUS STEEL SHALL CONFORM TO ASTM A36 UNLESS OTHERWISE INDICATED.
5. STEEL PIPE SHALL CONFORM TO ASTM A500 "COLD-FORMED WELDED & SEAMLESS CARBON STEEL STRUCTURAL TUBING", GRADE B, OR ASTM A53 PIPE STEEL BLACK AND HOT-DIPPED ZINC-COATED WELDED AND SEAMLESS TYPE E OR S, GRADE B. PIPE SIZES INDICATED ARE NOMINAL. ACTUAL OUTSIDE DIAMETER IS LARGER.
6. STRUCTURAL CONNECTION BOLTS SHALL BE HIGH STRENGTH BOLTS (BEARING TYPE) AND CONFORM TO ASTM A325 TYPE-X "HIGH STRENGTH BOLTS FOR STRUCTURAL JOINTS, INCLUDING SUITABLE NUTS AND PLAIN HARDENED WASHERS". ALL BOLTS SHALL BE 3/4" DIA UON.
7. ALL STEEL MATERIALS SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT-DIP GALVANIZED) COATINGS ON IRON AND STEEL PRODUCTS", UNLESS OTHERWISE NOTED.
8. ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC-COATING (HOT-DIP) ON IRON AND STEEL HARDWARE", UNLESS OTHERWISE NOTED.
9. FIELD WELDS, DRILL HOLES, SAW CUTS AND ALL DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED WITH AN ORGANIC ZINC REPAIR PAINT COMPLYING WITH REQUIREMENTS OF ASTM A780. GALVANIZING REPAIR PAINT SHALL HAVE 65 PERCENT ZINC BY WEIGHT, ZIRP BY DUNCAN GALVANIZING, GALVA BRIGHT PREMIUM BY CROWN OR EQUAL. THICKNESS OF APPLIED GALVANIZING REPAIR PAINT SHALL BE NOT NOT LESS THAN 4 COATS (ALLOW TIME TO DRY BETWEEN COATS) WITH A RESULTING COATING THICKNESS REQUIRED BY ASTM A123 OR A153 AS APPLICABLE.
10. CONTRACTOR SHALL COMPLY WITH AWS CODE FOR PROCEDURES, APPEARANCE AND QUALITY OF WELDS, AND FOR METHODS USED IN CORRECTING WELDING. ALL WELDERS AND WELDING PROCESSES SHALL BE QUALIFIED IN ACCORDANCE WITH AWS "STANDARD QUALIFICATION PROCEDURES". ALL WELDING SHALL BE DONE USING E70XX ELECTRODES AND WELDING SHALL CONFORM TO AISC AND DI.I. WHERE FILLET WELD SIZES ARE NOT SHOWN, PROVIDE THE MINIMUM SIZE PER TABLE J2.4 IN THE AISC "STEEL CONSTRUCTION MANUAL". 14TH EDITION.
11. INCORRECTLY FABRICATED, DAMAGED OR OTHERWISE MISFITTING OR NON-CONFORMING MATERIALS OR CONDITIONS SHALL BE REPORTED TO THE CONSTRUCTION MANAGER PRIOR TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE CONSTRUCTION MANAGER APPROVAL.
12. UNISTRUT SHALL BE FORMED STEEL CHANNEL STRUT FRAMING AS MANUFACTURED BY UNISTRUT CORP., WAYNE, MI OR EQUAL. STRUT MEMBERS SHALL BE 1 5/8"x1 5/8"x12GA, UNLESS OTHERWISE NOTED, AND SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION.
13. EPOXY ANCHOR ASSEMBLY SHALL CONSIST OF STAINLESS STEEL ANCHOR ROD WITH NUTS & WASHERS. AN INTERNALLY THREADED INSERT, A SCREEN TUBE AND A EPOXY ADHESIVE. THE ANCHORING SYSTEM SHALL BE THE HILTI-HIT HY-270 AND OR HY-200 SYSTEMS (AS SPECIFIED IN DWG.) OR ENGINEERS APPROVED EQUAL.
14. EXPANSION BOLTS SHALL CONFORM TO FEDERAL SPECIFICATION FF-S-325, GROUP II, TYPE 4, CLASS I, HILTI KWIK BOLT III OR APPROVED EQUAL. INSTALLATION SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
15. LUMBER SHALL COMPLY WITH THE REQUIREMENTS OF THE AMERICAN INSTITUTE OF TIMBER CONSTRUCTION AND THE NATIONAL FOREST PRODUCTS ASSOCIATION'S NATIONAL DESIGN SPECIFICATION FOR WOOD CONSTRUCTION. ALL LUMBER SHALL BE PRESSURE TREATED AND SHALL BE STRUCTURAL GRADE NO. 2 OR BETTER.
16. WHERE ROOF PENETRATIONS ARE REQUIRED, THE CONTRACTOR SHALL CONTACT AND COORDINATE RELATED WORK WITH THE BUILDING OWNER AND THE EXISTING ROOF INSTALLER. WORK SHALL BE PERFORMED IN SUCH A MANNER AS TO NOT VOID THE EXISTING ROOF WARRANTY. ROOF SHALL BE WATERTIGHT.
17. ALL FIBERGLASS MEMBERS USED ARE AS MANUFACTURED BY STRONGWELL COMPANY OF BRISTOL, VA 24203. ALL DESIGN CRITERIA FOR THESE MEMBERS IS BASED ON INFORMATION PROVIDED IN THE DESIGN MANUAL. ALL REQUIREMENTS PUBLISHED IN SAID MANUAL MUST BE STRICTLY ADHERED TO.
18. NO MATERIALS TO BE ORDERED AND NO WORK TO BE COMPLETED UNTIL SHOP DRAWINGS HAVE BEEN REVIEWED AND APPROVED IN WRITING.
19. SUBCONTRACTOR SHALL FIREPROOF ALL STEEL TO PRE-EXISTING CONDITIONS.

SPECIAL INSPECTIONS (REFERENCE IBC CHAPTER 17):

GENERAL: WHERE APPLICATION IS MADE FOR CONSTRUCTION, THE OWNER OR THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE ACTING AS THE OWNER'S AGENT SHALL EMPLOY ONE OR MORE APPROVED AGENCIES TO PERFORM INSPECTIONS DURING CONSTRUCTION ON THE TYPES OF WORK LISTED IN THE INSPECTION CHECKLIST ABOVE.

THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE AND ENGINEERS OF RECORD INVOLVED IN THE DESIGN OF THE PROJECT ARE PERMITTED TO ACT AS THE APPROVED AGENCY AND THEIR PERSONNEL ARE PERMITTED TO ACT AS THE SPECIAL INSPECTOR FOR THE WORK DESIGNED BY THEM, PROVIDED THOSE PERSONNEL MEET THE QUALIFICATION REQUIREMENTS.

STATEMENT OF SPECIAL INSPECTIONS: THE APPLICANT SHALL SUBMIT A STATEMENT OF SPECIAL INSPECTIONS PREPARED BY THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE IN ACCORDANCE WITH SECTION 107.1 AS A CONDITION FOR ISSUANCE. THIS STATEMENT SHALL BE IN ACCORDANCE WITH SECTION 1705.

REPORT REQUIREMENT: SPECIAL INSPECTORS SHALL KEEP RECORDS OF INSPECTIONS. THE SPECIAL INSPECTOR SHALL FURNISH INSPECTION REPORTS TO THE BUILDING OFFICIAL, AND TO THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE. REPORTS SHALL INDICATE THAT WORK INSPECTED WAS OR WAS NOT COMPLETED IN CONFORMANCE TO APPROVED CONSTRUCTION DOCUMENTS. DISCREPANCIES SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE CONTRACTOR FOR CORRECTION. IF THEY ARE NOT CORRECTED, THE DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE BUILDING OFFICIAL AND TO THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE. A FINAL REPORT DOCUMENTING REQUIRED SPECIAL INSPECTIONS SHALL BE SUBMITTED.

SPECIAL INSPECTION CHECKLIST

BEFORE CONSTRUCTION	
CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY ENGINEER OF RECORD)	REPORT ITEM
REQUIRED	ENGINEER OF RECORD APPROVED SHOP DRAWINGS [1]
REQUIRED	MATERIAL SPECIFICATIONS REPORT [2]
N/A	FABRICATOR NDE INSPECTION
REQUIRED	PACKING SLIPS [3]
ADDITIONAL TESTING AND INSPECTIONS:	
DURING CONSTRUCTION	
CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY ENGINEER OF RECORD)	REPORT ITEM
REQUIRED	STEEL INSPECTIONS
N/A	HIGH STRENGTH BOLT INSPECTIONS
N/A	HIGH WIND ZONE INSPECTIONS [4]
N/A	FOUNDATION INSPECTIONS
N/A	CONCRETE COMP. STRENGTH, SLUMP TESTS AND PLACEMENT
N/A	POST INSTALLED ANCHOR VERIFICATION [5]
N/A	GROUT VERIFICATION
N/A	CERTIFIED WELD INSPECTION
N/A	EARTHWORK: LIFT AND DENSITY
N/A	ON SITE COLD GALVANIZING VERIFICATION
N/A	GUY WIRE TENSION REPORT
ADDITIONAL TESTING AND INSPECTIONS:	
AFTER CONSTRUCTION	
CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY ENGINEER OF RECORD)	REPORT ITEM
REQUIRED	MODIFICATION INSPECTOR REDLINE OR RECORD DRAWINGS [6]
N/A	POST INSTALLED ANCHOR PULL-OUT TESTING
REQUIRED	PHOTOGRAPHS
ADDITIONAL TESTING AND INSPECTIONS:	

NOTES:

1. REQUIRED FOR ANY NEW SHOP FABRICATED FRP OR STEEL.
2. PROVIDED BY MANUFACTURER, REQUIRED IF HIGH STRENGTH BOLTS OR STEEL.
3. PROVIDED BY GENERAL CONTRACTOR; PROOF OF MATERIALS.
4. HIGH WIND ZONE INSPECTION CATB 120MPH OR CAT C,D 110MPH INSPECT FRAMING OF WALLS, ANCHORING, FASTENING SCHEDULE.
5. ADHESIVE FOR REBAR AND ANCHORS SHALL HAVE BEEN TESTED IN ACCORDANCE WITH ACI 355.4 AND ICC-ES AC308 FOR CRACKED CONCRETE AND SEISMIC APPLICATIONS. DESIGN ADHESIVE BOND STRENGTH HAS BEEN BASED ON ACI 355.4 TEMPERATURE CATEGORY B WITH INSTALLATIONS INTO DRY HOLES DRILLED USING A CARBIDE BIT INTO CRACKED CONCRETE THAT HAS CURED FOR AT LEAST 21 DAYS. ADHESIVE ANCHORS REQUIRING CERTIFIED INSTALLATIONS SHALL BE INSTALLED BY A CERTIFIED ADHESIVE ANCHOR INSTALLER PER ACI 318-11 D.9.2.2. INSTALLATIONS REQUIRING CERTIFIED INSTALLERS SHALL BE INSPECTED PER ACI 318-11 D.8.2.4.
6. AS REQUIRED; FOR ANY FIELD CHANGES TO THE ITEMS IN THIS TABLE.

NOTES:

1. ALL CONNECTIONS TO BE SHOP WELDED & FIELD BOLTED USING 3/4"ø A325-X BOLTS, UNLESS OTHERWISE NOTIFIED.
2. SHOP DRAWING ENGINEER REVIEW & APPROVAL REQUIRED BEFORE ORDERING MATERIAL.
3. SHOP DRAWING ENGINEER REVIEW & APPROVAL REQUIRED PRIOR TO STEEL FABRICATION.
4. VERIFICATION OF EXISTING ROOF CONSTRUCTION IS REQUIRED PRIOR TO THE INSTALLATION OF THE ROOF PLATFORM. ENGINEER OF RECORD IS TO APPROVE EXISTING CONDITIONS IN ORDER TO MOVE FORWARD.
5. CENTERLINE OF PROPOSED STEEL PLATFORM SUPPORT COLUMNS TO BE CENTRALLY LOCATED OVER THE EXISTING BUILDING COLUMNS.
6. EXISTING BRICK MASONRY COLUMNS/BEARING TO BE REPAIRED/REPLACED AT ALL PROPOSED PLATFORM SUPPORT POINTS. ENGINEER OF RECORD TO REVIEW AND APPROVE.

PREPARED FOR:

verizon

118 FLANDERS ROAD
WESTBOROUGH, MA 01581

HUDSON Design Group LLC
45 BEECHWOOD DRIVE
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

STATE OF CONNECTICUT
DANIEL P. HAMM
No. 24178
LICENSED PROFESSIONAL ENGINEER

CONSTRUCTION DRAWINGS ARE VALID FOR SIX MONTHS AFTER ENGINEER OF RECORD'S STAMPED AND SIGNED SUBMITTAL DATE LISTED HEREIN

CHECKED BY: JX

APPROVED BY: DPH

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
6	09/23/21	REVISED PER NEW RFDS	SF
5	12/17/18	REVISED PER COMMENTS	KAM
4	12/12/18	REVISED PER COMMENTS	KAM
3	07/20/18	REVISED PER COMMENTS	JS
2	07/11/18	REVISED PER COMMENTS	KAM
1	06/27/18	REVISED PER COMMENTS	KAM
0	01/25/18	ISSUED FOR REVIEW	SLY

SITE NAME:
NORTHFORD CT

SITE ADDRESS:
88 PARSONAGE ROAD
NORTHFORD, CT 06472

SHEET TITLE
STRUCTURAL NOTES & SPECIAL INSPECTIONS

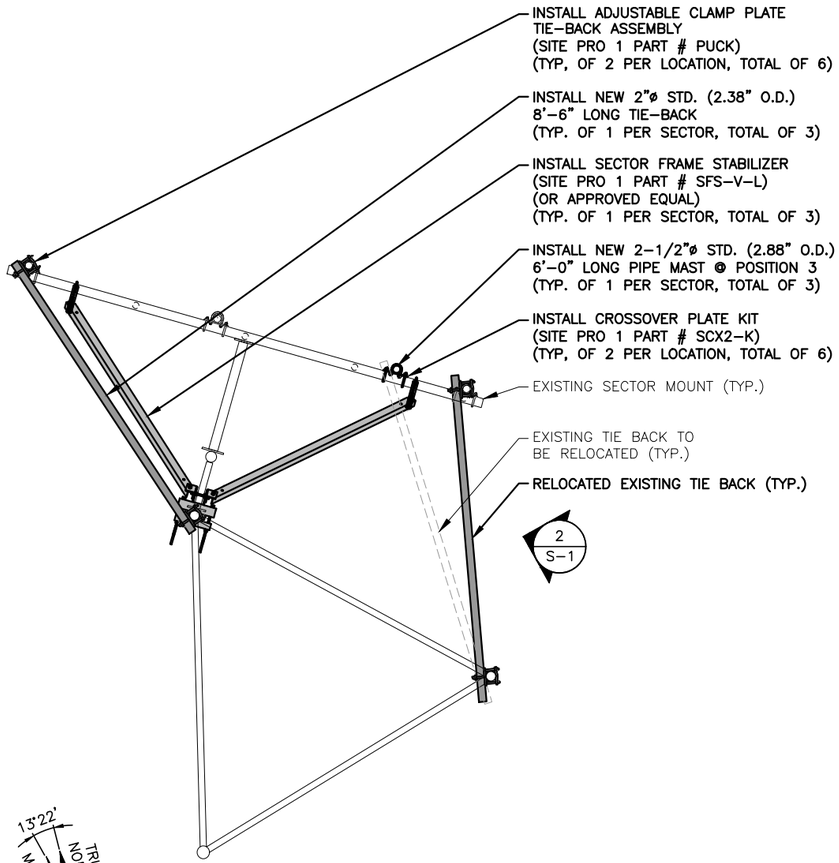
SHEET NUMBER
SN-1

NOTE:

AN ANALYSIS FOR THE CAPACITY OF THE EXISTING ANTENNA MOUNT TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY: HUDSON DESIGN GROUP, LLC.
DATED: AUGUST 18, 2021 (REV.4)

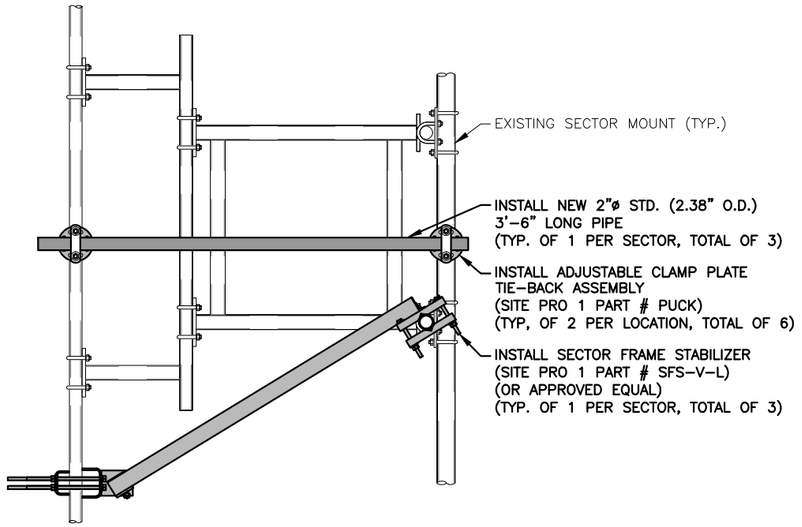
NOTE:

AN ANALYSIS OF THE CAPACITY OF THE EXISTING STRUCTURE TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY: CENTEK ENGINEERING.
DATED: AUGUST 30, 2021



MOUNT MODIFICATION PLAN 1 S-1
22x34 SCALE: 1/2"=1'-0"
11x17 SCALE: 1/4"=1'-0"

GRAPHIC SCALE
0 1 2 4 6 FEET



MOUNT MODIFICATION ELEVATION 2 S-1
22x34 SCALE: 1/2"=1'-0"
11x17 SCALE: 1/4"=1'-0"

GRAPHIC SCALE
0 1 2 4 6 FEET

PREPARED FOR:
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STATE OF CONNECTICUT
DANIEL P. HAMM
No. 24178
LICENSED PROFESSIONAL ENGINEER

CONSTRUCTION DRAWINGS ARE VALID FOR SIX MONTHS AFTER ENGINEER OF RECORD'S STAMPED AND SIGNED SURVIVAL DATE LISTED HEREIN

CHECKED BY: JX

APPROVED BY: DPH

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
6	09/23/21	REVISED PER NEW RFDS	SF
5	12/17/18	REVISED PER COMMENTS	KAM
4	12/12/18	REVISED PER COMMENTS	KAM
3	07/20/18	REVISED PER COMMENTS	JS
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0	01/25/18	ISSUED FOR REVIEW	SLY

SITE NAME:
NORTHFORD CT

SITE ADDRESS:
88 PARSONAGE ROAD
NORTHFORD, CT 06472

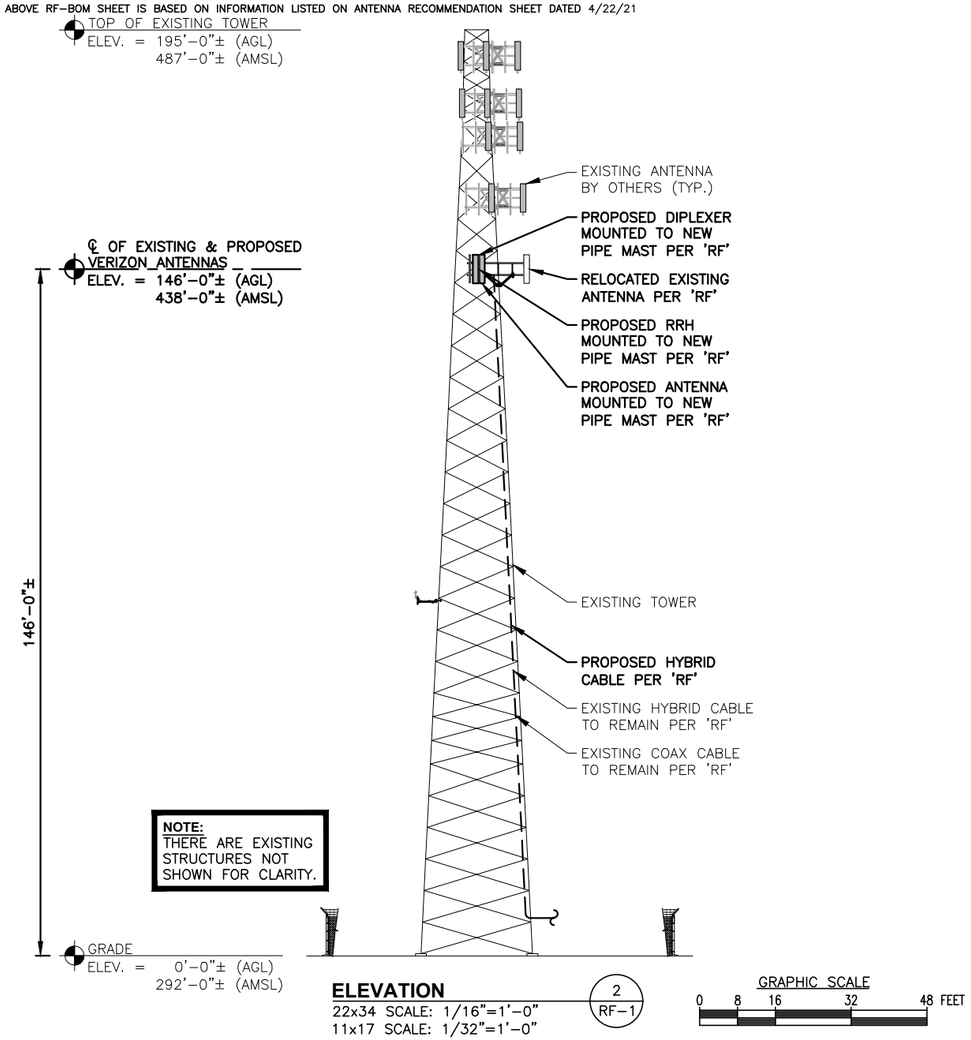
SHEET TITLE
STRUCTURAL DETAILS

SHEET NUMBER
S-1

BILL OF MATERIALS
SITE NAME: NORTHFORD CT

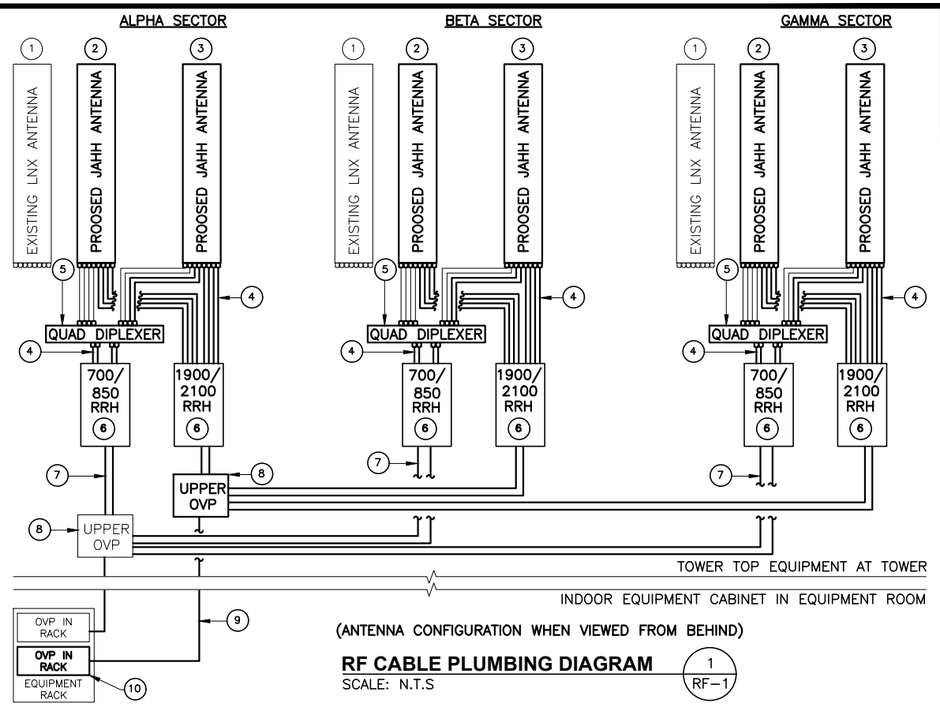
ITEM	DESCRIPTION	QTY	LENGTH	COMMENTS
(1)	EXISTING LNX-6513DS-VTM ANTENNA	3		MOUNTED TO EXISTING PIPE MAST
(2)	**PROPOSED JAHH-65B-R3B ANTENNA**	**3**		**MOUNTED TO PROPOSED PIPE MAST**
(3)	**PROPOSED JAHH-65B-R3B ANTENNA**	**3**		**MOUNTED TO PROPOSED PIPE MAST**
(4)	**PROPOSED 1/2" TOP COAX JUMPERS**	**42**	**6 FT.**	**ROUTE FROM RRH/DIPLEXER TO DIPLEXER/ANTENNA**
(4)	EXISTING 1/2" TOP COAX JUMPERS	18	6 FT.	ROUTE FROM RRH TO ANTENNA
(5)	**PROPOSED DIPLEXER CBC78T-DS-43-2X**	**3**		**MOUNTED TO PROPOSED PIPE MAST**
(6)	**PROPOSED LTE 700/850 RRH**	**3**		**SAMSUNG RRH B5/B13 RRH-BR04C PIPE MOUNTED**
(6)	**PROPOSED PCS/AWS 1900/2100 RRH**	**3**		**SAMSUNG RRH B2/B66A RRH-BR049 PIPE MOUNTED**
(7)	**PROPOSED SAMSUNG FIBER JUMPER CABLES**	**6**	**15 FT.**	**ROUTE FROM OVP TO RRH**
(7)	**PROPOSED SAMSUNG POWER JUMPER CABLES**	**6**	**15 FT.**	**ROUTE FROM OVP TO RRH**
(8)	**PROPOSED UPPER OVP**	**1**		**MOUNTED TO EXISTING TOWER LEG**
(8)	EXISTING UPPER OVP	1		MOUNTED TO EXISTING TOWER LEG
(9)	**PROPOSED 12X24 HYBRID CABLE**	**2**	**235 FT.**	**ROUTE FROM EQUIPMENT TO ANTENNA SECTOR**
(10)	**PROPOSED LOWER OVP**	**1**		**RACK MOUNTED INSIDE CABINET**
(10)	EXISTING LOWER OVP	1		RACK MOUNTED INSIDE CABINET
(11)	EXISTING COAX CABLES	6	235 FT.	ROUTE FROM EQUIPMENT TO ANTENNA SECTOR

THE ABOVE RF-BOM SHEET IS BASED ON INFORMATION LISTED ON ANTENNA RECOMMENDATION SHEET DATED 4/22/21



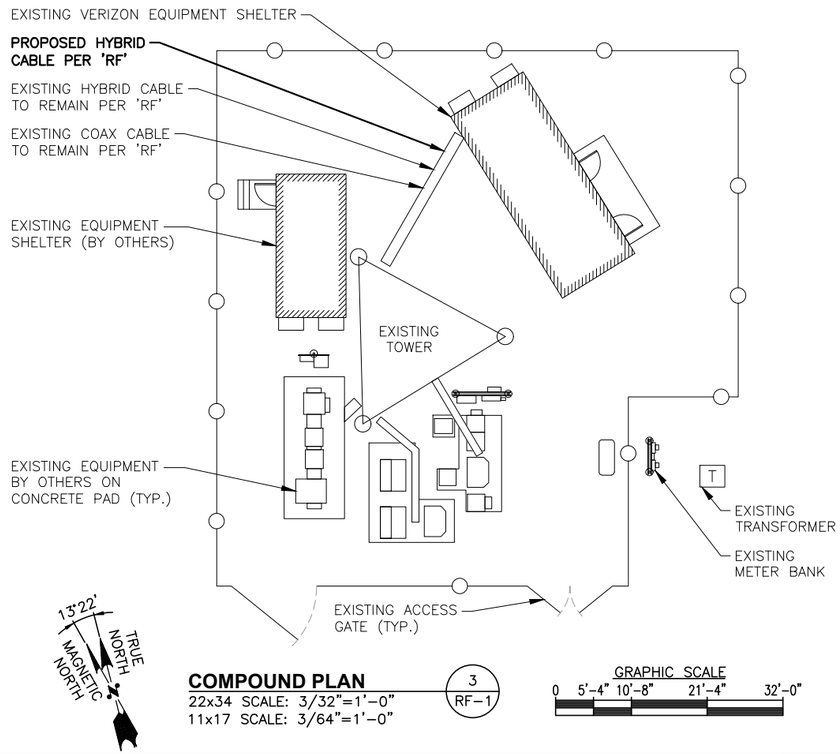
ELEVATION (2 / RF-1)
22x34 SCALE: 1/16"=1'-0"
11x17 SCALE: 1/32"=1'-0"

GRAPHIC SCALE
0 8 16 32 48 FEET



(ANTENNA CONFIGURATION WHEN VIEWED FROM BEHIND)

RF CABLE PLUMBING DIAGRAM (1 / RF-1)
SCALE: N.T.S



COMPOUND PLAN (3 / RF-1)
22x34 SCALE: 3/32"=1'-0"
11x17 SCALE: 3/64"=1'-0"

GRAPHIC SCALE
0 5'-4" 10'-8" 21'-4" 32'-0"

PREPARED FOR:
verizon
118 FLANDERS ROAD
WESTBOROUGH, MA 01581

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CHECKED BY: JX

APPROVED BY: DPH

SUBMITTALS

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0	01/25/18	ISSUED FOR REVIEW	SLY

SITE NAME:
NORTHFORD CT

SITE ADDRESS:
88 PARSONAGE ROAD
NORTHFORD, CT 06472

SHEET TITLE
RF PLUMBING DIAGRAM & BILL OF MATERIALS

SHEET NUMBER
RF-1

SAMSUNG

Dual-Band Radio Unit
700/850MHz (B13/B5)
RFV01U-D2A

Samsung's RFV01U-D2A is a compact remote Radio Unit (RU) designed for deployments that require flexibility in installation and rapid onlining, without compromising on coverage, capacity or operational expenses.

The RFV01U-D2A RU targets dual-band support across Band 13 (700MHz) and Band 5 (850MHz), making it an ideal product for broad coverage footprints across multiple common low-end, long-range frequencies.

The RU handles all Radio Frequency (RF) processing in a single, compact unit, and is designed to interface via CPRI with Samsung's CDU baseband offerings, in both distributed- and central-RAN configurations.

In addition to its minimal footprint and ease of installation, the RU is also designed to reduce cost of ownership through its integrated spectrum analyzer, which allows for remote RF monitoring, greatly reducing the need for on-site maintenance visits.

Features and Benefits

- Dual-band support for broad frequency coverage
- Minimal footprint reduces site costs
- Rapid, easy installation
- Flexibly deployable in any location
- Remote RF monitoring capability
- Convection cooled, silent operation

Key Technical Specifications

Duplex Type: FDD
Operating Frequencies:
B13: DL(746-756MHz)/UL(777-787MHz)
B5: DL(869-894MHz)/UL(824-849MHz)
Instantaneous Bandwidth: 10MHz(B13) + 25MHz(B5)
RF Chain: 4T4R/2T4R/2T2R
Output Power: Total 320W
DU-RU Interface: CPRI (10Gbps)
Dimensions: 380 x 380 x 207mm (29.9L)
Weight: 31.9kg
Input Power: -48V DC
Operating Temp.: -40 - 55°(w/o solar load)
Cooling: Natural convection

SAMSUNG

Dual-Band Radio Unit
AWS/PCS (B66/B2)
RFV01U-D1A

Samsung's RFV01U-D1A is a compact remote Radio Unit (RU) designed for deployments that require flexibility in installation and rapid onlining, without compromising on coverage, capacity or operational expenses.

The RFV01U-D1A RU targets dual-band support across Band 66 (AWS) and Band 2 (PCS), making it an ideal product for broad coverage footprints across multiple common mid-range frequencies.

The RU handles all Radio Frequency (RF) processing in a single, compact unit, and is designed to interface via CPRI with Samsung's CDU baseband offerings, in both distributed- and central-RAN configurations.

In addition to its minimal footprint and ease of installation, the RU is also designed to reduce cost of ownership through its integrated spectrum analyzer, which allows for remote RF monitoring, greatly reducing the need for on-site maintenance visits.

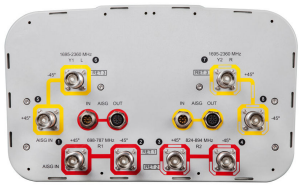
Features and Benefits

- Dual-band support for broad frequency coverage
- Minimal footprint reduces site costs
- Rapid, easy installation
- Flexibly deployable in any location
- Remote RF monitoring capability
- Convection cooled, silent operation
- Built-in Broadcast Auxiliary Services (BAS) filter ensures compliant AWS operation without impacting footprint

Key Technical Specifications

Duplex Type: FDD
Operating Frequencies:
    B66: DL(2,110-2,180MHz)/UL(1,710-1,780MHz)
    B2: DL(1,930-1,990MHz)/UL(1,850-1,910MHz)
Instantaneous Bandwidth:
    70MHz(B66) + 60MHz(B2)
RF Chain: 4T4R/2T4R/2T2R
Output Power: Total 320W
DU-RU Interface: CPRI (10Gbps)
Dimensions: 380 x 380 x 255mm (36.8L)
Weight: 38.3kg
Input Power: -48V DC
Operating Temp.: -40 - 55°(w/o solar load)
Cooling: Natural convection

JAHH-65B-R3B



8-port sector antenna, 2x 698–787, 2x 824-894 and 4x 1695–2360 MHz, 65° HPBW, 3x RET and low bands have diplexers. Internal SBT's on first LB(Port 1) and first HB(Port 5).

- Internal SBT on low and high band allow remote RET control from the radio over the RF jumper cable
- One RET for 700MHz, one RET for 850MHz, and one RET for both high bands to ensure same tilt level for 4x Rx or 4x MIMO
- Internal filter on low band and interleaved dipole technology providing for attractive, low wind load mechanical package
- Separate RS-485 RET input/output for low and high band

General Specifications

Antenna Type	Sector
Band	Multiband
Color	Light gray
Effective Projective Area (EPA), frontal	0.28 m^2 | 3.014 ft^2
Effective Projective Area (EPA), lateral	0.24 m^2 | 2.583 ft^2
Grounding Type	RF connector body grounded to reflector and mounting bracket
Performance Note	Outdoor usage | Wind loading figures are validated by wind tunnel measurements described in white paper WP-112534-EN
Radome Material	Fiberglass, UV resistant
Radiator Material	Aluminum | Low loss circuit board
Reflector Material	Aluminum
RF Connector Interface	4.3-10 Female
RF Connector Location	Bottom
RF Connector Quantity, high band	4
RF Connector Quantity, low band	4
RF Connector Quantity, total	8

Remote Electrical Tilt (RET) Information, General

RET Interface	8-pin DIN Female | 8-pin DIN Male
RET Interface, quantity	2 female | 2 male

Dimensions

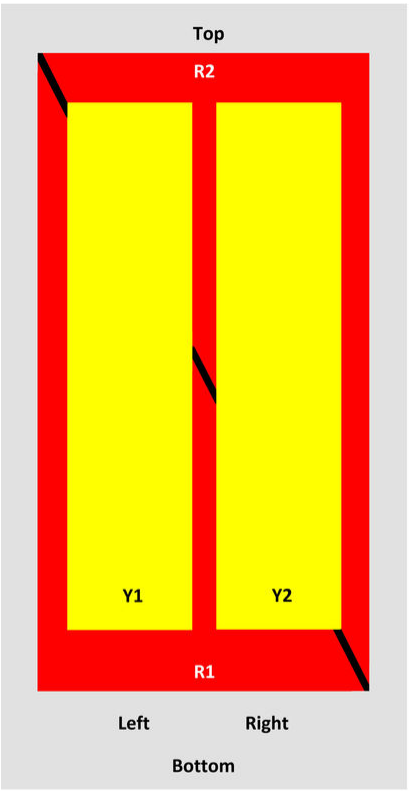
Width	350 mm | 13.78 in

JAHH-65B-R3B

Length	1828 mm | 71.969 in
Depth	208 mm | 8.189 in

Array Layout

JAHH-65A-R3B JAHH-65B-R3B JAHH-65C-R3B



Array	Freq (MHz)	Conns	RET (SRET)	AISG RET UID
R1	698-798	1-2	1	ANxxxxxxxxxxxxxxx1
R2	824-894	3-4	2	ANxxxxxxxxxxxxxxx2
Y1	1695-2360	5-6	3	ANxxxxxxxxxxxxxxx3
Y2	1695-2360	7-8		

View from the front of the antenna

(Sizes of colored boxes are not true depictions of array sizes)

Electrical Specifications

Impedance	50 ohm
Operating Frequency Band	1695 – 2360 MHz | 698 – 787 MHz | 824 – 894 MHz
Polarization	±45°

Remote Electrical Tilt (RET) Information, Electrical

Protocol	3GPP/AISG 2.0 (Single RET)
Power Consumption, idle state, maximum	2 W

JAHH-65B-R3B

Power Consumption, normal conditions, maximum	13 W
Input Voltage	10–30 Vdc
Internal Bias Tee	Port 1 | Port 5
Internal RET	High band (1) | Low band (2)

Electrical Specifications

Frequency Band, MHz	**698–787**	**824–894**	**1695–1880**	**1850–1990**	**1920–2200**	**2300–2360**
Gain, dBi	14.5	15.8	18	18.4	18.5	18.8
Beamwidth, Horizontal, degrees	67	65	63	63	65	68
Beamwidth, Vertical, degrees	12.4	10.5	5.7	5.2	4.9	4.4
Beam Tilt, degrees	2–14	2–14	0–10	0–10	0–10	0–10
USLS (First Lobe), dB	18	18	20	20	21	23
Front-to-Back Ratio at 180°, dB	32	34	31	35	36	38
Isolation, Cross Polarization, dB	25	25	25	25	25	25
Isolation, Inter-band, dB	30	30	30	30	30	30
VSWR | Return loss, dB	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0
PIM, 3rd Order, 2 x 20 W, dBc	-153	-153	-153	-153	-153	-153
Input Power per Port at 50° C, maximum, watts	200	200	300	300	300	250

Electrical Specifications, BASTA

Frequency Band, MHz	**698–787**	**824–894**	**1695–1880**	**1850–1990**	**1920–2200**	**2300–2360**
Gain by all Beam Tilts, average, dBi	14.3	14.9	17.6	18.1	18.2	18.5
Gain by all Beam Tilts Tolerance, dB	±0.3	±0.5	±0.6	±0.4	±0.5	±0.6
Gain by Beam Tilt, average, dBi	2 ° | 14.3 8 ° | 14.3 14 ° | 14.3	2 ° | 15.0 8 ° | 14.9 14 ° | 15.4	0 ° | 17.2 5 ° | 17.6 10 ° | 17.6	0 ° | 17.6 5 ° | 18.2 10 ° | 18.2	0 ° | 17.7 5 ° | 18.3 10 ° | 18.3	0 ° | 17.9 5 ° | 18.7 10 ° | 18.7
Beamwidth, Horizontal Tolerance, degrees	±1.2	±1.4	±4	±2.4	±2.9	±2.7
Beamwidth, Vertical Tolerance, degrees	±0.9	±0.5	±0.3	±0.2	±0.3	±0.1
USLS, beampeak to 20° above beampeak, dB	18	17	17	18	19	18
Front-to-Back Total Power at 180° ± 30°, dB	25	24	26	29	27	29
CPR at Boresight, dB	22	23	20	21	21	24

CPR at Sector, dB	11	12	11	11	11	8

Mechanical Specifications

Wind Loading at Velocity, frontal	301.0 N @ 150 km/h | 67.7 lbf @ 150 km/h
Wind Loading at Velocity, lateral	254.0 N @ 150 km/h | 57.1 lbf @ 150 km/h
Wind Loading at Velocity, maximum	143.4 lbf @ 150 km/h | 638.0 N @ 150 km/h
Wind Speed, maximum	241 km/h | 149.75 mph

Packaging and Weights

Width, packed	456 mm | 17.953 in
Depth, packed	357 mm | 14.055 in
Length, packed	1975 mm | 77.756 in
Net Weight, without mounting kit	29.2 kg | 64.375 lb
Weight, gross	42.5 kg | 93.696 lb

Regulatory Compliance/Certifications

Agency	Classification
CHINA-ROHS	Above maximum concentration value
ISO 9001:2015	Designed, manufactured and/or distributed under this quality management system
ROHS	Compliant/Exempted

Included Products

BSAMNT-3	—	Wide Profile Antenna Downtilt Mounting Kit for 2.4 - 4.5 in (60 - 115 mm) OD round members. Kit contains one scissor top bracket set and one bottom bracket set.

* Footnotes

Performance Note	Severe environmental conditions may degrade optimum performance

ATTACHMENT 3

	General	Power	Density					
Site Name: Northford (North Branford)								
Tower Height: Verizon @ 146ft								
CARRIER	**# OF CHAN.**	**WATTS ERP**	**HEIGHT**	**FREQ.**	**CALC. POWER DENS**	**MAX. PERMISS.EXP.**	**FRACTION MPE**	**Total**
*Nextel	9	100	160	850	0.013647248	0.566666667	0.002408338	
*Motient	4	381	140	855	0.03052245	0.57	0.005354816	
*Sprint	1	438	190.5	850	0.004627276	0.566666667	0.000816578	
*Sprint	2	438	190.5	850	0.009254552	0.566666667	0.001633156	
*Sprint	5	623	190.5	1900	0.032908594	1	0.003290859	
*Sprint	2	1556	190.5	1900	0.032876901	1	0.00328769	
*Sprint	8	778	190.5	2500	0.065753802	1	0.00657538	
*T-Mobile	1	11044.63	180	2500	0.131188782	1	0.013118878	
*T-Mobile	1	1074	180	2500	0.012757037	1	0.001275704	
*T-Mobile	1	22089	180	2500	0.262374475	1	0.026237448	
*T-Mobile	1	2148	180	2500	0.025514074	1	0.26%	
*T-Mobile	2	592	180	600	0.014063623	0.4	0.35%	
*T-Mobile	1	1578	180	600	0.018743579	0.4	0.47%	
*T-Mobile	2	695	180	700	0.016510504	0.466666667	0.35%	
*T-Mobile	2	2105	180	1900	0.050006634	1	0.50%	
*T-Mobile	2	1325	180	2100	0.03147686	1	0.31%	
*T-Mobile	4	1028	180	1900	0.048842584	1	0.49%	
*T-Mobile	2	2057	180	1900	0.04886634	1	0.49%	
*T-Mobile	2	2308	180	2100	0.054829127	1	0.55%	
*AT&T	2	545.9	170	850	0.014598204	0.566666667	0.26%	
*AT&T	4	612.4	170	700	0.032753031	0.466666667	0.70%	
*AT&T	4	1114.4	170	1900	0.059601532	1	0.60%	
*AT&T	4	1250.4	170	2100	0.066875229	1	0.67%	
*AT&T	4	598.5	170	700	0.0320	0.466666667	0.69%	
*AT&T	4	558.5	170	850	0.0299	0.566666667	0.53%	
*AT&T	4	650	170	2300	0.0348	1	0.35%	
VZW 700	**4**	**634**	**146**	**751**	**0.0043**	**0.5007**	**0.85%**	
VZW CDMA	**2**	**392**	**146**	**877.26**	**0.0013**	**0.5848**	**0.23%**	
VZW Cellular	**4**	**458**	**146**	**874**	**0.0031**	**0.5827**	**0.53%**	
VZW PCS	**4**	**1580**	**146**	**1975**	**0.0107**	**1.0000**	**1.07%**	
VZW AWS	**4**	**1605**	**146**	**2120**	**0.0108**	**1.0000**	**1.08%**	
								17.72%
* Source: Siting Council								

ATTACHMENT 4

CENTEK engineering

Centered on Solutions℠

Structural Analysis Report

195' Existing Lattice Tower

Proposed Verizon Wireless
Antenna Upgrade

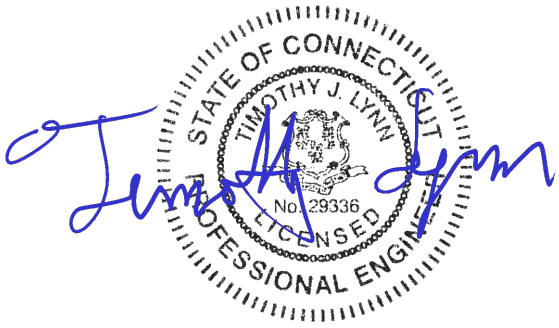
Site Ref: Northford

88 Parsonage Hill Road
Northford, CT

Centek Project No. 21007.37

Date: August 30, 2021

Max Stress Ratio = 77%



Prepared for:

Verizon Wireless
20 Alexander Drive
Wallingford, CT 06492

Table of Contents

Introduction

The purpose of this report is to summarize the results of the non-linear, P-Δ structural analysis of the antenna upgrade proposed by Verizon Wireles on the existing lattice tower located in Northford (North Branford), Connecticut.

The host tower is a 195-ft, three legged, lattice tower originally designed and manufactured by Central Tower project no. F-722 dated 4/9/99. The tower geometry, structure member sizes and foundation information were taken from the aforementioned design documents.

Existing antenna and appurtenance inventory was taken from a previous structural analysis prepared by Centek dated April 28, 2021.

Proposed antenna and appurtenance inventory for T-Mobile was taken from an RF data sheet dated 4/22/21.

The tower consists of ten (10) vertical sections consisting of solid round pipe legs conforming to ASTM A529 Gr. 50 and steel angle lateral bracing conforming to ASTM A36. The vertical tower sections are connected by bolted flange plates with the diagonal and horizontal bracing to pipe legs consisting of bolted connections. The width of the tower face is 5-ft 0-in at the top and 23-ft 6-in at the bottom.

Antenna and Appurtenance Summary

The existing and proposed loads considered in the analysis consist of the following:

- Sprint (Existing):
  Antenna: Three (3) RFS APXVSPP18-C-A20 panel antennas, three (3) 1900MHz 4X45W RRHs, three (3) 800MHz 2X50W RRHs and three (3) Notch Filters mounted on a triangular platform with a RAD center elevation of ±192-ft above grade level.
  Coax Cable: Three (3) 1-1/4"∅ Hybriflex cables running on a leg/face of the existing tower as specified in Section 3 of this report.
- T-MOBILE (Existing/Reserved):
  Antennas: Three (3) Ericsson AIR6449 panel antennas, three (3) Ericsson AIR32 panel antennas, three (3) RFS APXVAALL24_43 panel antennas, three (3) TMAs, three (3) Ericsson 4449 remote radio heads, three (3) Ericsson 4415 remote radio heads and three (3) Commscope SDX1926Q-43 diplexers mounted on three (3) SitePro VFA12-HD V-Frames with a RAD center elevation of ±180-ft above grade level.
  Coax Cables: Six (6) 1-5/8" ∅ coax cables and three (3) 1-5/8" ∅ fiber cable running on a face of the existing tower as specified in Section 3 of this report.
- AT&T (Existing/Reserved):
  Antenna: Three (3) Kathrein 800-10121 panel antennas, three (3) CCI OPA65R-BU6DA panel antennas, three (3) CCI DMP65R-BU6DA panel antennas, six (6) Powerwave LGP21401 TMAs, three (3) Ericsson 4478 B14 remote radio heads, three (3) Ericsson 4449 B5/B12 remote radio heads, three (3) Ericsson 8843 B2/B66A remote radio heads and two (2) Raycap DC6-48-60-18-8F surge arrestors mounted on three (3) 12-ft T-Frames with a RAD center elevation of ±172-ft above grade level.
  Coax Cable: Six (6) 1-5/8" ∅ coax cables, two (2) fiber cable and four (4) dc control cables running on a leg/face of the existing tower as specified in Section 3 of this report.

- Empty Mounts (Existing):
  Antenna: Three (3) 12-ft T-Frames with a RAD center elevation of ±160-ft above grade level.
- Verizon (Existing to Remain):
  Antennas: Three (3) Andrew LNX-6513DS panel antennas and one (1) main distribution box mounted on (3) 12-ft T-Frames with a RAD center elevation of ±146-ft above grade level.
  Coax Cable: Twelve (12) 1-5/8" ∅ coax cables and one (1) 1-5/8" ∅ fiber cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- Verizon (Existing to Remove):
  Antennas: Three (3) Antel BXA-171063-12CF panel antennas, three (3) Antel BXA-171085/8BF panel antennas, three (3) Antel BXA-70063/6CF panel antennas, three (3) RFS diplexers, three (3) Alcatel-Lucent RRH2x40-AWS remote radio heads, three (3) B13 RRH4x30 and three (3) B4 RRH2x40 remote radio heads mounted on (3) 12-ft T-Frames with a RAD center elevation of ±146-ft above grade level.
- **VERIZON (PROPOSED):**
  Antennas: Six (6) Commscope JAHH-65B-R3B panel antennas, three (3) Samsung B2/B66A remote radio heads, three (3) Samsung B5/B13 remote radio heads, three (3) Commscope CBC78T-DS-43 diplexers and one (1) OVP box mounted on (3) 12-ft T-Frames with a RAD center elevation of ±146-ft above grade level.
  Coax Cable: One (1) 1-5/8" ∅ fiber cable running on a leg/face of the existing tower as specified in Section 3 of this report
  Mount Modifications: Install three (3) SitePro SFS-V-L sector frame stabilizer kits per the mount analysis report prepared by Hudson Design Group dated August 18, 2021.
- Sprint (Existing):
  Antenna: One (1) GPS antenna on a 2-ft standoff with an elevation of ±80-ft above grade level.
  Coax Cable: One (1) 1/2" ∅ coax cable running on a leg/face of the existing tower as specified in Section 3 of this report.

Primary Assumptions Used in the Analysis

- The tower structure's theoretical capacity not including any assessment of the condition of the tower.
- The tower carries the horizontal and vertical loads due to the weight of antennas, ice load and wind.
- Tower is properly installed and maintained.
- Tower is in plumb condition.
- Tower loading for antennas and mounts as listed in this report.
- All bolts are appropriately tightened providing the necessary connection continuity.
- All welds are fabricated with ER-70S-6 electrodes.
- All members are assumed to be as specified in the original tower design documents.
- All members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.
- All member protective coatings are in good condition.
- All tower members were properly designed, detailed, fabricated, installed and have been properly maintained since erection.
- Any deviation from the analyzed antenna loading will require a new analysis for verification of structural adequacy.
- All coax cables should be routed as specified in section 3 of this report.

Analysis

The existing tower was analyzed using a comprehensive computer program entitled tnxTower. The program analyzes the tower, considering the worst case loading condition. The tower is considered as loaded by concentric forces along the tower, and the model assumes that the tower members are subjected to bending, axial, and shear forces.

The existing tower was analyzed for the controlling basic wind speed (3-second gust) with no ice and the applicable wind and ice combination to determine stresses in members as per guidelines of TIA-222-G-2005 entitled "Structural Standard for Antenna Support Structures and Antennas", the American Institute of Steel Construction (AISC) and the Manual of Steel Construction; Load and Resistance Factor Design (LRFD).

The controlling wind speed is determined by evaluating the local available wind speed data as provided in Appendix N of the CSBC[1] and the wind speed data available in the TIA-222-G-2005 Standard.

Tower Loading

Tower loading was determined by the basic wind speed as applied to projected surface areas with modification factors per TIA-222-G-2005, gravity loads of the tower structure and its components, and the application of 0.75" radial ice on the tower structure and its components.

Basic Wind Speed:	Northford; v = 101 mph (Vasd)	*[Appendix N of the 2018 CT Building Code]*
Load Cases:	Load Case 1; 101 mph wind speed w/ no ice plus gravity load – used in calculation of tower stresses and rotation.	*[Appendix N of the 2018 CT Building Code]*
	Load Case 2; 50 mph wind speed w/ 0.75" radial ice plus gravity load – used in calculation of tower stresses.	*[Annex B of TIA-222-G-2005]*

[1] The 2015 International Building Code as amended by the 2018 Connecticut State Building Code (CSBC).

Tower Capacity

Tower stresses were calculated utilizing the structural analysis software tnxTower. Design flexural strength was determined based on section 4.7 and Table 4-8 of the TIA-222-G.

- Calculated stresses **were found to be within allowable limits**.

Tower Section	Elevation	Stress Ratio (percentage of capacity)	Result
Diagonal (T10)	0'-0"-20'-0"	76.5%	**PASS**
Leg (T9)	20'-0"-40'-0"	67.2%	**PASS**

Foundation and Anchors

The existing foundation consists of a three (3) 3-ft ∅ x 4-ft long reinforced concrete piers concentrically bearing on a 34-ft square x 2-ft 6-in thick reinforced concrete mat. The sub grade conditions used in the foundation analysis were derived from the aforementioned design documents. The base of the tower is connected to the foundation by means of (8) 1.375"∅, ASTM A449 anchor bolts per leg embedded 5-ft 10-in into the concrete foundation structure.

- The tower reactions developed from the governing Load Case were used in the verification of the foundation and anchor bolts:

Load Effect	Proposed Tower Reactions
Leg Shear	46,147 lbs
Leg Compression	434,989 lbs
Leg Tension	369,316 lbs
Base Moment	8,288,354 ft-lbs
Base Shear	75,611 lbs

- The anchor bolts were found to be within allowable limits.

Tower Section	Component	Stress Ratio (percentage of capacity)	Result
Anchor Bolts	Tension	51.9%	**PASS**

- The foundation was found to be within allowable limits.

Foundation	Design Limit	TIA-222-G Section 9.4 FS[1]	Proposed Loading (FS)[1]	Result
Reinforced Concrete Pad and Piers	Overturning	1.0	1.57	**PASS**

Note 1: FS denotes Factor of Safety

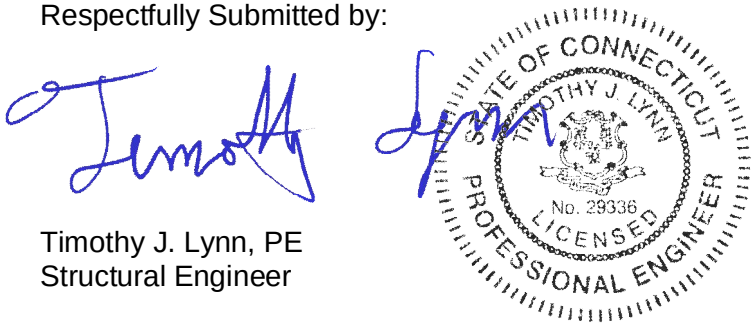
Conclusion

This analysis shows that the subject tower **is adequate** to support the proposed antenna configuration with the below recommendations.

The analysis is based, in part, on the information provided to this office by Verizon. If the existing conditions are different than the information in this report, Centek Engineering, Inc. must be contacted for resolution of any potential issues.

Please feel free to call with any questions or comments.

Respectfully Submitted by:



Timothy J. Lynn, PE
Structural Engineer

Standard Conditions for Furnishing of Professional Engineering Services on Existing Structures

All engineering services are performed on the basis that the information used is current and correct. This information may consist of, but is not necessarily limited to:

- Information supplied by the client regarding the structure itself, its foundations, the soil conditions, the antenna and feed line loading on the structure and its components, or other relevant information.
- Information from the field and/or drawings in the possession of Centek Engineering, Inc. or generated by field inspections or measurements of the structure.
- It is the responsibility of the client to ensure that the information provided to Centek Engineering, Inc. and used in the performance of our engineering services is correct and complete. In the absence of information to the contrary, we assume that all structures were constructed in accordance with the drawings and specifications and are in an un-corroded condition and have not deteriorated. It is therefore assumed that its capacity has not significantly changed from the “as new” condition.
- All services will be performed to the codes specified by the client, and we do not imply to meet any other codes or requirements unless explicitly agreed in writing. If wind and ice loads or other relevant parameters are to be different from the minimum values recommended by the codes, the client shall specify the exact requirement. In the absence of information to the contrary, all work will be performed in accordance with the latest revision of ANSI/ASCE10 & ANSI/EIA-222
- All services performed, results obtained, and recommendations made are in accordance with generally accepted engineering principles and practices. Centek Engineering, Inc. is not responsible for the conclusions, opinions and recommendations made by others based on the information we supply.

GENERAL DESCRIPTION OF STRUCTURAL ANALYSIS PROGRAM

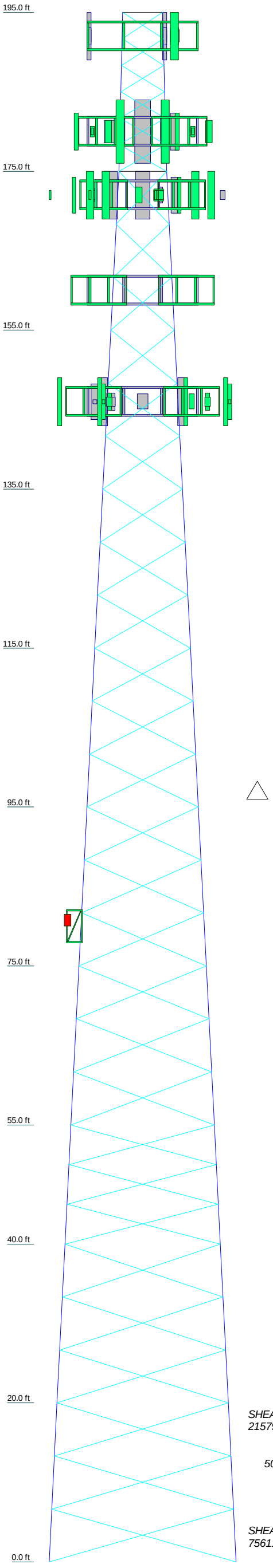
tnxTower, is an integrated structural analysis and design software package for Designed specifically for the telecommunications industry, tnxTower, formerly RISA Tower, automates much of the tower analysis and design required by the TIA/EIA 222 Standard.

tnxTower Features:

- tnxTower can analyze and design 3- and 4-sided guyed towers, 3- and 4-sided self-supporting towers and either round or tapered ground mounted poles with or without guys.
- The program analyzes towers using the TIA-222-G (2005) standard or any of the previous TIA/EIA standards back to RS-222 (1959). Steel design is checked using the AISC ASD 9th Edition or the AISC LRFD specifications.
- Linear and non-linear (P-delta) analyses can be used in determining displacements and forces in the structure. Wind pressures and forces are automatically calculated.
- Extensive graphics plots include material take-off, shear-moment, leg compression, displacement, twist, feed line, guy anchor and stress plots.
- tnxTower contains unique features such as True Cable behavior, hog rod take-up, foundation stiffness and much more.

T1	SR 3		SR 1 1/4		SR 1 1/4	SR 1 1/4	5	6 @ 3.33333	2548.7
T2	SR 3 3/4		L2 1/2x2 1/2x3/16				6		2793.3
T3	SR 4		L2 1/2x2 1/2x5/16				8		3572.1
T4	SR 4 1/4		L3x3x1/4				10	18 @ 6.66667	4036.1
T5			L3x3x3/8				12		4788.8
T6	SR 4 1/2		L3 1/2x3 1/2x5/16				14		5354.2
T7			L4x4x1/4				16		5794.0
T8	SR 4 3/4						18	3 @ 5	5023.9
T9			L4x4x5/16				19.5		6793.1
T10	SR 5		L4x4x3/8				21.5	6 @ 6.66667	8126.5
Section	Legs	Leg Grade	Diagonals	Diagonal Grade	Top Girts	Bottom Girts	Face Width (ft) 23.5	# Panels @ (ft)	Weight (lb) 48831.6

A529-50 | A36 | N.A. | N.A.



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Top Triangular Mount (Sprint)	192	800 10121 (ATI)	172
APXVSPP18-C-A20 (Sprint)	192	OPA65R-BU6D (ATI)	172
APXVSPP18-C-A20 (Sprint)	192	DMP65R-BU6D (ATI)	172
APXVSPP18-C-A20 (Sprint)	192	(2) LGP21401 TMA (ATI)	172
FD-RRH 2x50 800 (Sprint)	192	(2) LGP21401 TMA (ATI)	172
FD-RRH 2x50 800 (Sprint)	192	(2) LGP21401 TMA (ATI)	172
FD-RRH 2x50 800 (Sprint)	192	DC6-48-60-18-8F Surge Arrestor (ATI)	172
Notch Filter (Sprint)	192	DC6-48-60-18-8F Surge Arrestor (ATI)	172
Notch Filter (Sprint)	192	4478 B14 (ATI)	172
Notch Filter (Sprint)	192	4478 B14 (ATI)	172
FD-RRH 4x45 1900 (Sprint)	192	4478 B14 (ATI)	172
FD-RRH 4x45 1900 (Sprint)	192	4449 B5/B12 (ATI)	172
FD-RRH 4x45 1900 (Sprint)	192	4449 B5/B12 (ATI)	172
SitePro VFA12-HD (T-Mobile)	180	4449 B5/B12 (ATI)	172
SitePro VFA12-HD (T-Mobile)	180	8843 B2/B66A (ATI)	172
SitePro VFA12-HD (T-Mobile)	180	8843 B2/B66A (ATI)	172
AIR6449 (T-Mobile)	180	8843 B2/B66A (ATI)	172
APXVAALL24-43 (T-Mobile)	180	Pirod 12' T-Frame Sector Mount (1) (Empty)	160
AIR32 (T-Mobile)	180	Pirod 12' T-Frame Sector Mount (1) (Empty)	160
AIR6449 (T-Mobile)	180	Pirod 12' T-Frame Sector Mount (1) (Empty)	160
APXVAALL24-43 (T-Mobile)	180	Pirod 12' T-Frame Sector Mount (1) (Verizon)	146
AIR32 (T-Mobile)	180	Pirod 12' T-Frame Sector Mount (1) (Verizon)	146
AIR6449 (T-Mobile)	180	Pirod 12' T-Frame Sector Mount (1) (Verizon)	146
APXVAALL24-43 (T-Mobile)	180	SitePro SFS-V-L (Verizon Proposed)	146
AIR32 (T-Mobile)	180	SitePro SFS-V-L (Verizon Proposed)	146
4449 B12,B71 (T-Mobile)	180	SitePro SFS-V-L (Verizon Proposed)	146
4449 B12,B71 (T-Mobile)	180	LNX-6513DS-VTM (Verizon)	146
4449 B12,B71 (T-Mobile)	180	(2) JAHH-65B-R3B (Verizon Proposed)	146
4415 B25 (T-Mobile)	180	LNX-6513DS-VTM (Verizon)	146
4415 B25 (T-Mobile)	180	(2) JAHH-65B-R3B (Verizon Proposed)	146
4415 B25 (T-Mobile)	180	LNX-6513DS-VTM (Verizon)	146
SDX1926Q-43 (T-Mobile)	180	(2) JAHH-65B-R3B (Verizon Proposed)	146
SDX1926Q-43 (T-Mobile)	180	B2/B66A RRH (Verizon Proposed)	146
SDX1926Q-43 (T-Mobile)	180	B2/B66A RRH (Verizon Proposed)	146
TMA 10"x8"x3" (T-Mobile)	180	B2/B66A RRH (Verizon Proposed)	146
TMA 10"x8"x3" (T-Mobile)	180	B5/B13 RRH (Verizon Proposed)	146
TMA 10"x8"x3" (T-Mobile)	180	B5/B13 RRH (Verizon Proposed)	146
Pirod 12' T-Frame Sector Mount (1) (ATI)	172	B5/B13 RRH (Verizon Proposed)	146
Pirod 12' T-Frame Sector Mount (1) (ATI)	172	RC2DC-3315-PF-48 (Verizon)	146
Pirod 12' T-Frame Sector Mount (1) (ATI)	172	CBC78T-DS-43 (Verizon Proposed)	146
800 10121 (ATI)	172	CBC78T-DS-43 (Verizon Proposed)	146
OPA65R-BU6D (ATI)	172	CBC78T-DS-43 (Verizon Proposed)	146
DMP65R-BU6D (ATI)	172	RC2DC-3315-PF-48 (Verizon Proposed)	146
800 10121 (ATI)	172	GPS (Sprint)	80
OPA65R-BU6D (ATI)	172	2-ft Stand Off (Sprint)	80
DMP65R-BU6D (ATI)	172		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A529-50	50 ksi	65 ksi	A36	36 ksi	58 ksi

TOWER DESIGN NOTES

1. Tower designed for Exposure C to the TIA-222-G Standard.
2. Tower designed for a 101 mph basic wind in accordance with the TIA-222-G Standard.
3. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 60 mph wind.
5. Tower Structure Class II.
6. Topographic Category 1 with Crest Height of 0.00 ft
7. TOWER RATING: 76.5%

ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 434989 lb
SHEAR: 46147 lb

UPLIFT: -369316 lb
SHEAR: 40019 lb

AXIAL 179498 lb
SHEAR 21579 lb *MOMENT 2487725 lb-ft*
TORQUE 28405 lb-ft
50 mph WIND - 0.7500 in ICE

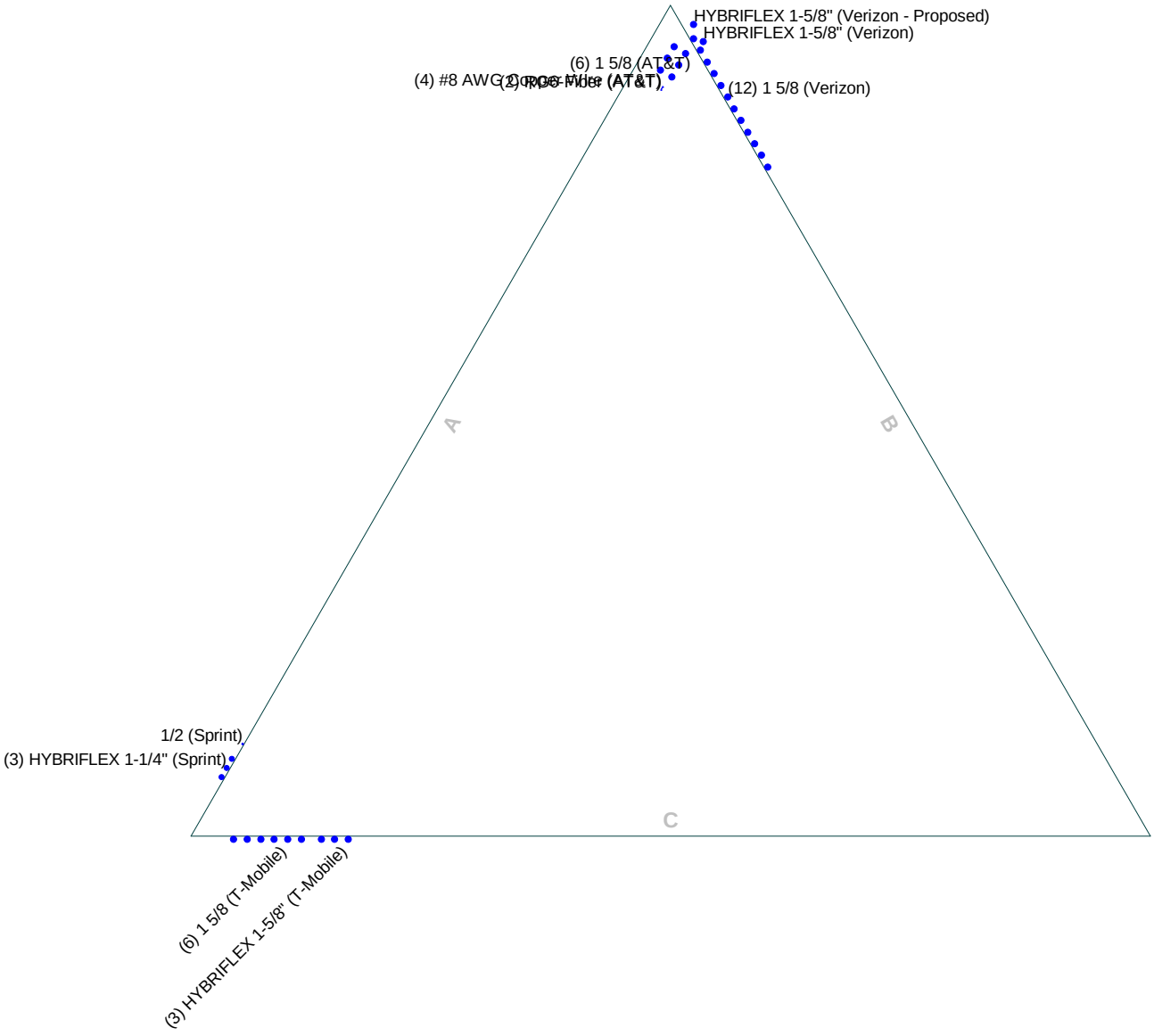
AXIAL 83197 lb
SHEAR 75611 lb *MOMENT 8288354 lb-ft*
TORQUE 66819 lb-ft
REACTIONS - 101 mph WIND

Centek Engineering Inc.
63-2 North Branford Rd.
Branford, CT 06405
Phone: (203) 488-0580
FAX: (203) 488-8587

Job:	***21007.37 - Northford***		
Project:	***195' Lattice Tower - 88 Parsonage Hill Rd., Northford, CT***		
Client: Verizon	Drawn by: TJL	App'd:	
Code: TIA-222-G	Date: 08/30/21	Scale: NTS	
Path: J:\Jobs\2100700.WI\37_Northford CT\05_Structural\Backup Documentation\ER Files\195-ft Central Lattice Tower.eri		Dwg No. E-1	

Feed Line Plan

Round Flat App In Face App Out Face



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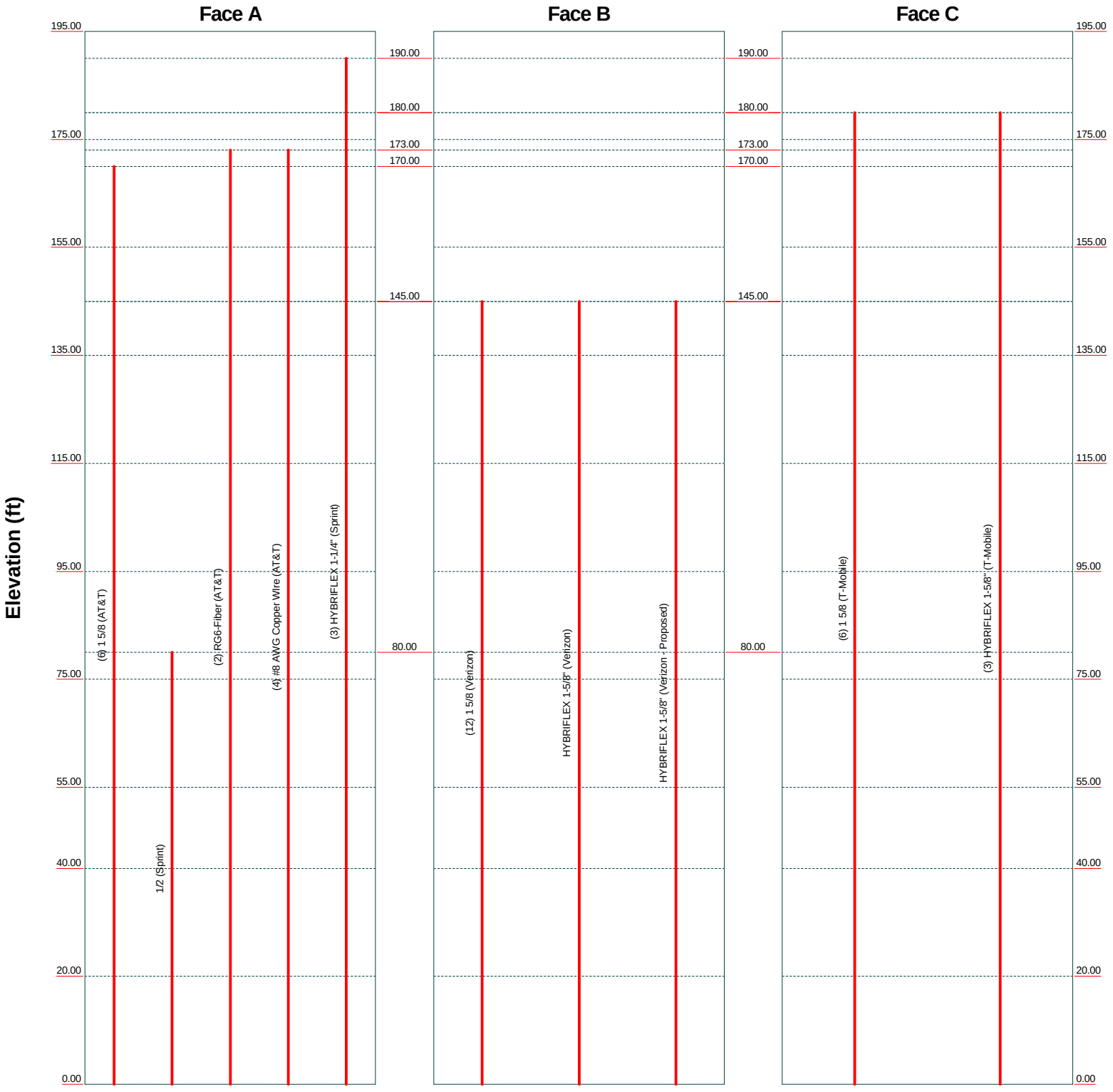
Path: J:\Jobs\21000\700.WI\37_Northford CT\05_Structural\Backup Documentation\ER Files\195-ft Central_Lattice Tower.eri		Dwg No. E-7

Feed Line Distribution Chart
0' - 195'

Round | Flat | App In Face | App Out Face | Truss Leg



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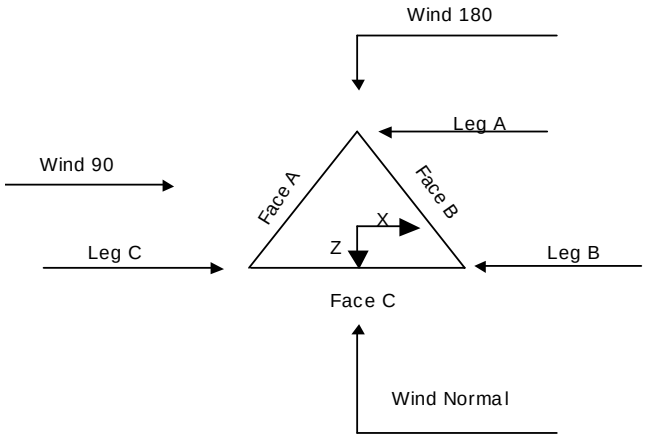
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 195.00 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 5.00 ft at the top and 23.50 ft at the base.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

Basic wind speed of 101 mph.
Structure Class II.
Exposure Category C.
Topographic Category 1.
Crest Height 0.00 ft.
Nominal ice thickness of 0.7500 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in tower member design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

	Consider Moments - Legs		Distribute Leg Loads As Uniform		Use ASCE 10 X-Brace Ly Rules
	Consider Moments - Horizontals		Assume Legs Pinned	√	Calculate Redundant Bracing Forces
	Consider Moments - Diagonals	√	Assume Rigid Index Plate		Ignore Redundant Members in FEA
	Use Moment Magnification	√	Use Clear Spans For Wind Area	√	SR Leg Bolts Resist Compression
√	Use Code Stress Ratios	√	Use Clear Spans For KL/r	√	All Leg Panels Have Same Allowable
√	Use Code Safety Factors - Guys		Retension Guys To Initial Tension		Offset Girt At Foundation
	Escalate Ice		Bypass Mast Stability Checks	√	Consider Feed Line Torque
	Always Use Max Kz	√	Use Azimuth Dish Coefficients		Include Angle Block Shear Check
	Use Special Wind Profile	√	Project Wind Area of Appurt.		Use TIA-222-G Bracing Resist. Exemption
√	Include Bolts In Member Capacity		Autocalc Torque Arm Areas		Use TIA-222-G Tension Splice Exemption
	Leg Bolts Are At Top Of Section		Add IBC .6D+W Combination		Poles
	Secondary Horizontal Braces Leg	√	Sort Capacity Reports By Component		Include Shear-Torsion Interaction
	Use Diamond Inner Bracing (4 Sided)		Triangulate Diamond Inner Bracing		Always Use Sub-Critical Flow
√	SR Members Have Cut Ends		Treat Feed Line Bundles As Cylinder		Use Top Mounted Sockets
	SR Members Are Concentric		Ignore KL/ry For 60 Deg. Angle Legs		Pole Without Linear Attachments
					Pole With Shroud Or No Appurtenances
					Outside and Inside Corner Radii Are Known



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
T1	195.00-175.00			5.00	1	20.00
T2	175.00-155.00			6.00	1	20.00
T3	155.00-135.00			8.00	1	20.00
T4	135.00-115.00			10.00	1	20.00
T5	115.00-95.00			12.00	1	20.00
T6	95.00-75.00			14.00	1	20.00
T7	75.00-55.00			16.00	1	20.00
T8	55.00-40.00			18.00	1	15.00
T9	40.00-20.00			19.50	1	20.00
T10	20.00-0.00			21.50	1	20.00

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T1	195.00-175.00	3.33	X Brace	No	Yes	0.0000	0.0000
T2	175.00-155.00	6.67	X Brace	No	No	0.0000	0.0000
T3	155.00-135.00	6.67	X Brace	No	No	0.0000	0.0000
T4	135.00-115.00	6.67	X Brace	No	No	0.0000	0.0000
T5	115.00-95.00	6.67	X Brace	No	No	0.0000	0.0000

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T6	95.00-75.00	6.67	X Brace	No	No	0.0000	0.0000
T7	75.00-55.00	6.67	X Brace	No	No	0.0000	0.0000
T8	55.00-40.00	5.00	X Brace	No	No	0.0000	0.0000
T9	40.00-20.00	6.67	X Brace	No	No	0.0000	0.0000
T10	20.00-0.00	6.67	X Brace	No	No	0.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 195.00-175.00	Solid Round	3	A529-50 (50 ksi)	Solid Round	1 1/4	A36 (36 ksi)
T2 175.00-155.00	Solid Round	3 3/4	A529-50 (50 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T3 155.00-135.00	Solid Round	4	A529-50 (50 ksi)	Single Angle	L2 1/2x2 1/2x5/16	A36 (36 ksi)
T4 135.00-115.00	Solid Round	4 1/4	A529-50 (50 ksi)	Single Angle	L3x3x1/4	A36 (36 ksi)
T5 115.00-95.00	Solid Round	4 1/4	A529-50 (50 ksi)	Single Angle	L3x3x3/8	A36 (36 ksi)
T6 95.00-75.00	Solid Round	4 1/2	A529-50 (50 ksi)	Single Angle	L3 1/2x3 1/2x5/16	A36 (36 ksi)
T7 75.00-55.00	Solid Round	4 3/4	A529-50 (50 ksi)	Single Angle	L4x4x1/4	A36 (36 ksi)
T8 55.00-40.00	Solid Round	4 3/4	A529-50 (50 ksi)	Single Angle	L4x4x1/4	A36 (36 ksi)
T9 40.00-20.00	Solid Round	4 3/4	A529-50 (50 ksi)	Single Angle	L4x4x5/16	A36 (36 ksi)
T10 20.00-0.00	Solid Round	5	A529-50 (50 ksi)	Single Angle	L4x4x3/8	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 195.00-175.00	Solid Round	1 1/4	A36 (36 ksi)	Solid Round	1 1/4	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
T1 195.00-175.00	0.00	0.0000	A36 (36 ksi)	1	1	1	30.0000	30.0000	36.0000
T2 175.00-155.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T3 155.00-135.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T4 135.00-115.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T5 115.00-95.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T6 95.00-75.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T7 75.00-55.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T8 55.00-40.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T9 40.00-20.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T10 20.00-0.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1	Yes	Yes	1	1	1	1	1	1	1	1
195.00-175.00				1	1	1	1	1	1	1
T2	Yes	Yes	1	1	1	1	1	1	1	1
175.00-155.00				1	1	1	1	1	1	1
T3	Yes	Yes	1	1	1	1	1	1	1	1
155.00-135.00				1	1	1	1	1	1	1
T4	Yes	Yes	1	1	1	1	1	1	1	1
135.00-115.00				1	1	1	1	1	1	1
T5	Yes	Yes	1	1	1	1	1	1	1	1
115.00-95.00				1	1	1	1	1	1	1
T6	Yes	Yes	1	1	1	1	1	1	1	1
95.00-75.00				1	1	1	1	1	1	1
T7	Yes	Yes	1	1	1	1	1	1	1	1
75.00-55.00				1	1	1	1	1	1	1
T8	Yes	Yes	1	1	1	1	1	1	1	1
55.00-40.00				1	1	1	1	1	1	1
T9	Yes	Yes	1	1	1	1	1	1	1	1
40.00-20.00				1	1	1	1	1	1	1
T10	Yes	Yes	1	1	1	1	1	1	1	1
20.00-0.00				1	1	1	1	1	1	1

[1]*Note: K factors are applied to member segment lengths. K-braces without inner supporting members will have the K factor in the out-of-plane direction applied to the overall length.*

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 195.00-175.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	0.75	0.0000	1	0.0000	0.75
T2 175.00-155.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T3 155.00-135.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T4 135.00-115.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T5 115.00-95.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T6 95.00-75.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T7 75.00-55.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T8 55.00-40.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T9 40.00-20.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T10 20.00-0.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1

Tower Elevation ft	Redundant Horizontal		Redundant Diagonal		Redundant Sub-Diagonal		Redundant Sub-Horizontal		Redundant Vertical		Redundant Hip		Redundant Hip Diagonal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 195.00-175.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 175.00-155.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 155.00-135.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 135.00-115.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 115.00-95.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T6 95.00-75.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T7 75.00-55.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T8 55.00-40.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T9 40.00-20.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T10 20.00-0.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg Bolt Size in	Leg No.	Diagonal Bolt Size in	Diagonal No.	Top Girt Bolt Size in	Top Girt No.	Bottom Girt Bolt Size in	Bottom Girt No.	Mid Girt Bolt Size in	Mid Girt No.	Long Horizontal Bolt Size in	Long Horizontal No.	Short Horizontal Bolt Size in	Short Horizontal No.
T1 195.00-175.00	Flange	1.1250 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T2 175.00-155.00	Flange	1.1250 A325N	6	0.8750 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T3 155.00-135.00	Flange	1.1250 A325N	6	0.8750 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T4 135.00-115.00	Flange	1.1250 A325N	6	0.8750 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T5 115.00-95.00	Flange	1.1250 A325N	8	1.0000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T6 95.00-75.00	Flange	1.1250 A325N	8	1.0000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T7 75.00-55.00	Flange	1.2500 A325N	8	1.0000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T8 55.00-40.00	Flange	1.2500 A325N	8	1.0000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325X	0
T9 40.00-20.00	Flange	1.2500 A325N	8	1.0000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325X	0
T10 20.00-0.00	Flange	1.3750 A449	8	1.0000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325X	0

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
1 5/8 (Verizon)	B	No	No	Ar (CaAa)	145.00 - 0.00	0.0000	-0.38	12	12	1.9800	1.9800		1.04
1 5/8 (AT&T)	A	No	No	Ar (CaAa)	170.00 - 0.00	-10.0000	0.45	6	3	1.9800	1.9800		1.04
1 5/8 (T-Mobile)	C	No	No	Ar (CaAa)	180.00 - 0.00	0.0000	0.42	6	6	1.9800	1.9800		1.04
1/2 (Sprint)	A	No	No	Ar (CaAa)	80.00 - 0.00	0.0000	-0.39	1	1	0.5800	0.5800		0.25
RG6-Fiber (AT&T)	A	No	No	Ar (CaAa)	173.00 - 0.00	-10.0000	0.42	2	2	0.5000	0.5000		1.00
#8 AWG Copper WIre (AT&T)	A	No	No	Ar (CaAa)	173.00 - 0.00	-10.0000	0.42	4	4	0.2500	0.1285		0.05
HYBRIFLEX 1-5/8" (T-Mobile)	C	No	No	Ar (CaAa)	180.00 - 0.00	0.0000	0.35	3	3	1.9800	1.9800		1.90
HYBRIFLEX 1-1/4" (Sprint)	A	No	No	Ar (CaAa)	190.00 - 0.00	0.0000	-0.42	3	3	1.5400	1.5400		1.30
HYBRIFLEX 1-5/8" (Verizon)	B	No	No	Ar (CaAa)	145.00 - 0.00	2.0000	-0.45	1	1	1.9800	1.9800		1.90
HYBRIFLEX 1-5/8" (Verizon - Proposed)	B	No	No	Ar (CaAa)	145.00 - 0.00	2.0000	-0.47	1	1	1.9800	1.9800		1.90

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
T1	195.00-175.00	A	0.000	0.000	6.930	0.000	58.50
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	8.910	0.000	59.70
T2	175.00-155.00	A	0.000	0.000	29.785	0.000	211.20
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	35.640	0.000	238.80
T3	155.00-135.00	A	0.000	0.000	36.028	0.000	246.80
		B	0.000	0.000	27.720	0.000	162.80
		C	0.000	0.000	35.640	0.000	238.80
T4	135.00-115.00	A	0.000	0.000	36.028	0.000	246.80
		B	0.000	0.000	55.440	0.000	325.60
		C	0.000	0.000	35.640	0.000	238.80
T5	115.00-95.00	A	0.000	0.000	36.028	0.000	246.80
		B	0.000	0.000	55.440	0.000	325.60
		C	0.000	0.000	35.640	0.000	238.80
T6	95.00-75.00	A	0.000	0.000	36.318	0.000	248.05
		B	0.000	0.000	55.440	0.000	325.60
		C	0.000	0.000	35.640	0.000	238.80
T7	75.00-55.00	A	0.000	0.000	37.188	0.000	251.80
		B	0.000	0.000	55.440	0.000	325.60
		C	0.000	0.000	35.640	0.000	238.80
T8	55.00-40.00	A	0.000	0.000	27.891	0.000	188.85
		B	0.000	0.000	41.580	0.000	244.20
		C	0.000	0.000	26.730	0.000	179.10
T9	40.00-20.00	A	0.000	0.000	37.188	0.000	251.80
		B	0.000	0.000	55.440	0.000	325.60
		C	0.000	0.000	35.640	0.000	238.80
T10	20.00-0.00	A	0.000	0.000	37.188	0.000	251.80
		B	0.000	0.000	55.440	0.000	325.60
		C	0.000	0.000	35.640	0.000	238.80

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
T1	195.00-175.00	A	1.782	0.000	0.000	23.188	0.000	328.69
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	25.316	0.000	398.55
T2	175.00-155.00	A	1.762	0.000	0.000	89.611	0.000	1378.82
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	101.010	0.000	1579.99
T3	155.00-135.00	A	1.739	0.000	0.000	102.366	0.000	1619.80
		B		0.000	0.000	72.569	0.000	1192.88
		C		0.000	0.000	100.728	0.000	1564.18
T4	135.00-115.00	A	1.714	0.000	0.000	101.659	0.000	1600.51
		B		0.000	0.000	144.792	0.000	2358.18
		C		0.000	0.000	100.409	0.000	1546.32
T5	115.00-95.00	A	1.684	0.000	0.000	100.842	0.000	1578.38
		B		0.000	0.000	144.392	0.000	2326.44
		C		0.000	0.000	100.040	0.000	1525.77
T6	95.00-75.00	A	1.649	0.000	0.000	101.809	0.000	1575.99

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
		B		0.000	0.000	143.916	0.000	2288.86
		C		0.000	0.000	99.602	0.000	1501.44
T7	75.00-55.00	A	1.605	0.000	0.000	106.248	0.000	1611.00
		B		0.000	0.000	143.327	0.000	2242.54
		C		0.000	0.000	99.061	0.000	1471.46
T8	55.00-40.00	A	1.556	0.000	0.000	78.513	0.000	1177.93
		B		0.000	0.000	106.993	0.000	1642.71
		C		0.000	0.000	73.835	0.000	1078.22
T9	40.00-20.00	A	1.486	0.000	0.000	102.481	0.000	1514.61
		B		0.000	0.000	141.715	0.000	2117.22
		C		0.000	0.000	97.583	0.000	1390.36
T10	20.00-0.00	A	1.331	0.000	0.000	97.615	0.000	1395.03
		B		0.000	0.000	139.633	0.000	1958.12
		C		0.000	0.000	95.680	0.000	1287.47

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T1	195.00-175.00	-7.2903	4.5100	-7.8871	4.7906
T2	175.00-155.00	-9.6558	1.5229	-13.0921	2.3380
T3	155.00-135.00	-8.4739	-8.5933	-11.6012	-9.0587
T4	135.00-115.00	-7.4715	-15.5846	-10.6269	-17.6096
T5	115.00-95.00	-8.5279	-17.5826	-12.3171	-20.1702
T6	95.00-75.00	-8.9948	-18.2938	-13.7619	-21.8418
T7	75.00-55.00	-9.4198	-18.5655	-15.4407	-22.7975
T8	55.00-40.00	-8.8391	-17.5417	-15.3263	-22.7200
T9	40.00-20.00	-10.4393	-20.4942	-17.5380	-25.8757
T10	20.00-0.00	-10.9076	-21.3778	-18.5024	-27.3790

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	3	1 5/8	175.00 - 180.00	0.6000	0.5397
T1	7	HYBRIFLEX 1-5/8"	175.00 - 180.00	0.6000	0.5397
T1	8	HYBRIFLEX 1-1/4"	175.00 - 190.00	0.6000	0.5397
T2	2	1 5/8	155.00 - 170.00	0.6000	0.6000
T2	3	1 5/8	155.00 - 175.00	0.6000	0.6000
T2	5	RG6-Fiber	155.00 - 173.00	0.6000	0.6000
T2	6	#8 AWG Copper WIre	155.00 - 173.00	0.6000	0.6000
T2	7	HYBRIFLEX 1-5/8"	155.00 - 175.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T2	8	HYBRIFLEX 1-1/4"	155.00 - 175.00	0.6000	0.6000
T3	1	1 5/8	135.00 - 145.00	0.6000	0.6000
T3	2	1 5/8	135.00 - 155.00	0.6000	0.6000
T3	3	1 5/8	135.00 - 155.00	0.6000	0.6000
T3	5	RG6-Fiber	135.00 - 155.00	0.6000	0.6000
T3	6	#8 AWG Copper WIre	135.00 - 155.00	0.6000	0.6000
T3	7	HYBRIFLEX 1-5/8"	135.00 - 155.00	0.6000	0.6000
T3	8	HYBRIFLEX 1-1/4"	135.00 - 155.00	0.6000	0.6000
T3	9	HYBRIFLEX 1-5/8"	135.00 - 145.00	0.6000	0.6000
T3	10	HYBRIFLEX 1-5/8"	135.00 - 145.00	0.6000	0.6000
T4	1	1 5/8	115.00 - 135.00	0.6000	0.6000
T4	2	1 5/8	115.00 - 135.00	0.6000	0.6000
T4	3	1 5/8	115.00 - 135.00	0.6000	0.6000
T4	5	RG6-Fiber	115.00 - 135.00	0.6000	0.6000
T4	6	#8 AWG Copper WIre	115.00 - 135.00	0.6000	0.6000
T4	7	HYBRIFLEX 1-5/8"	115.00 - 135.00	0.6000	0.6000
T4	8	HYBRIFLEX 1-1/4"	115.00 - 135.00	0.6000	0.6000
T4	9	HYBRIFLEX 1-5/8"	115.00 - 135.00	0.6000	0.6000
T4	10	HYBRIFLEX 1-5/8"	115.00 - 135.00	0.6000	0.6000
T5	1	1 5/8	95.00 - 115.00	0.6000	0.6000
T5	2	1 5/8	95.00 - 115.00	0.6000	0.6000
T5	3	1 5/8	95.00 - 115.00	0.6000	0.6000
T5	5	RG6-Fiber	95.00 - 115.00	0.6000	0.6000
T5	6	#8 AWG Copper WIre	95.00 - 115.00	0.6000	0.6000
T5	7	HYBRIFLEX 1-5/8"	95.00 - 115.00	0.6000	0.6000
T5	8	HYBRIFLEX 1-1/4"	95.00 - 115.00	0.6000	0.6000
T5	9	HYBRIFLEX 1-5/8"	95.00 - 115.00	0.6000	0.6000
T5	10	HYBRIFLEX 1-5/8"	95.00 - 115.00	0.6000	0.6000
T6	1	1 5/8	75.00 - 95.00	0.6000	0.6000
T6	2	1 5/8	75.00 - 95.00	0.6000	0.6000
T6	3	1 5/8	75.00 - 95.00	0.6000	0.6000
T6	4	1/2	75.00 - 80.00	0.6000	0.6000
T6	5	RG6-Fiber	75.00 - 95.00	0.6000	0.6000
T6	6	#8 AWG Copper WIre	75.00 - 95.00	0.6000	0.6000
T6	7	HYBRIFLEX 1-5/8"	75.00 - 95.00	0.6000	0.6000
T6	8	HYBRIFLEX 1-1/4"	75.00 - 95.00	0.6000	0.6000
T6	9	HYBRIFLEX 1-5/8"	75.00 - 95.00	0.6000	0.6000
T6	10	HYBRIFLEX 1-5/8"	75.00 - 95.00	0.6000	0.6000
T7	1	1 5/8	55.00 - 75.00	0.6000	0.6000
T7	2	1 5/8	55.00 - 75.00	0.6000	0.6000
T7	3	1 5/8	55.00 - 75.00	0.6000	0.6000
T7	4	1/2	55.00 - 75.00	0.6000	0.6000
T7	5	RG6-Fiber	55.00 - 75.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T7	6	#8 AWG Copper WIre	55.00 - 75.00	0.6000	0.6000
T7	7	HYBRIFLEX 1-5/8"	55.00 - 75.00	0.6000	0.6000
T7	8	HYBRIFLEX 1-1/4"	55.00 - 75.00	0.6000	0.6000
T7	9	HYBRIFLEX 1-5/8"	55.00 - 75.00	0.6000	0.6000
T7	10	HYBRIFLEX 1-5/8"	55.00 - 75.00	0.6000	0.6000
T8	1	1 5/8	40.00 - 55.00	0.6000	0.6000
T8	2	1 5/8	40.00 - 55.00	0.6000	0.6000
T8	3	1 5/8	40.00 - 55.00	0.6000	0.6000
T8	4	1/2	40.00 - 55.00	0.6000	0.6000
T8	5	RG6-Fiber	40.00 - 55.00	0.6000	0.6000
T8	6	#8 AWG Copper WIre	40.00 - 55.00	0.6000	0.6000
T8	7	HYBRIFLEX 1-5/8"	40.00 - 55.00	0.6000	0.6000
T8	8	HYBRIFLEX 1-1/4"	40.00 - 55.00	0.6000	0.6000
T8	9	HYBRIFLEX 1-5/8"	40.00 - 55.00	0.6000	0.6000
T8	10	HYBRIFLEX 1-5/8"	40.00 - 55.00	0.6000	0.6000
T9	1	1 5/8	20.00 - 40.00	0.6000	0.6000
T9	2	1 5/8	20.00 - 40.00	0.6000	0.6000
T9	3	1 5/8	20.00 - 40.00	0.6000	0.6000
T9	4	1/2	20.00 - 40.00	0.6000	0.6000
T9	5	RG6-Fiber	20.00 - 40.00	0.6000	0.6000
T9	6	#8 AWG Copper WIre	20.00 - 40.00	0.6000	0.6000
T9	7	HYBRIFLEX 1-5/8"	20.00 - 40.00	0.6000	0.6000
T9	8	HYBRIFLEX 1-1/4"	20.00 - 40.00	0.6000	0.6000
T9	9	HYBRIFLEX 1-5/8"	20.00 - 40.00	0.6000	0.6000
T9	10	HYBRIFLEX 1-5/8"	20.00 - 40.00	0.6000	0.6000
T10	1	1 5/8	0.00 - 20.00	0.6000	0.6000
T10	2	1 5/8	0.00 - 20.00	0.6000	0.6000
T10	3	1 5/8	0.00 - 20.00	0.6000	0.6000
T10	4	1/2	0.00 - 20.00	0.6000	0.6000
T10	5	RG6-Fiber	0.00 - 20.00	0.6000	0.6000
T10	6	#8 AWG Copper WIre	0.00 - 20.00	0.6000	0.6000
T10	7	HYBRIFLEX 1-5/8"	0.00 - 20.00	0.6000	0.6000
T10	8	HYBRIFLEX 1-1/4"	0.00 - 20.00	0.6000	0.6000
T10	9	HYBRIFLEX 1-5/8"	0.00 - 20.00	0.6000	0.6000
T10	10	HYBRIFLEX 1-5/8"	0.00 - 20.00	0.6000	0.6000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
Top Triangular Mount (Sprint)	C	From Face	2.00 0.00 0.00	0.0000	192.00	No Ice 1/2" Ice 1" Ice	75.30 86.60 97.90	75.30 86.60 97.90	2500.00 2875.00 3250.00
APXVSPP18-C-A20 (Sprint)	A	From Face	4.00 -4.00 0.00	0.0000	192.00	No Ice 1/2" Ice 1" Ice	8.02 8.48 8.94	5.28 5.74 6.20	57.00 106.52 162.12
APXVSPP18-C-A20 (Sprint)	B	From Face	4.00 -4.00 0.00	0.0000	192.00	No Ice 1/2" Ice 1" Ice	8.02 8.48 8.94	5.28 5.74 6.20	57.00 106.52 162.12
APXVSPP18-C-A20	C	From Face	4.00	0.0000	192.00	No Ice	8.02	5.28	57.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
(Sprint)			-4.00			1/2" Ice	8.48	5.74	106.52
			0.00			1" Ice	8.94	6.20	162.12
FD-RRH 2x50 800	A	From Face	4.00	0.0000	192.00	No Ice	2.06	1.93	64.00
(Sprint)			-4.00			1/2" Ice	2.24	2.11	86.12
			0.00			1" Ice	2.43	2.29	111.30
FD-RRH 2x50 800	B	From Face	4.00	0.0000	192.00	No Ice	2.06	1.93	64.00
(Sprint)			-4.00			1/2" Ice	2.24	2.11	86.12
			0.00			1" Ice	2.43	2.29	111.30
FD-RRH 2x50 800	C	From Face	4.00	0.0000	192.00	No Ice	2.06	1.93	64.00
(Sprint)			-4.00			1/2" Ice	2.24	2.11	86.12
			0.00			1" Ice	2.43	2.29	111.30
Notch Filter	A	From Face	4.00	0.0000	192.00	No Ice	0.74	0.32	10.00
(Sprint)			-4.00			1/2" Ice	0.85	0.40	16.32
			0.00			1" Ice	0.97	0.48	24.34
Notch Filter	B	From Face	4.00	0.0000	192.00	No Ice	0.74	0.32	10.00
(Sprint)			-4.00			1/2" Ice	0.85	0.40	16.32
			0.00			1" Ice	0.97	0.48	24.34
Notch Filter	C	From Face	4.00	0.0000	192.00	No Ice	0.74	0.32	10.00
(Sprint)			-4.00			1/2" Ice	0.85	0.40	16.32
			0.00			1" Ice	0.97	0.48	24.34
FD-RRH 4x45 1900	A	From Face	4.00	0.0000	192.00	No Ice	2.32	2.38	60.00
(Sprint)			-4.00			1/2" Ice	2.52	2.59	83.97
			0.00			1" Ice	2.74	2.80	111.21
FD-RRH 4x45 1900	B	From Face	4.00	0.0000	192.00	No Ice	2.32	2.38	60.00
(Sprint)			-4.00			1/2" Ice	2.52	2.59	83.97
			0.00			1" Ice	2.74	2.80	111.21
FD-RRH 4x45 1900	C	From Face	4.00	0.0000	192.00	No Ice	2.32	2.38	60.00
(Sprint)			-4.00			1/2" Ice	2.52	2.59	83.97
			0.00			1" Ice	2.74	2.80	111.21
SitePro VFA12-HD	A	From Leg	2.00	0.0000	180.00	No Ice	21.00	21.00	750.00
(T-Mobile)			0.00			1/2" Ice	25.00	25.00	900.00
			0.00			1" Ice	29.00	29.00	1050.00
SitePro VFA12-HD	B	From Leg	2.00	0.0000	180.00	No Ice	21.00	21.00	750.00
(T-Mobile)			0.00			1/2" Ice	25.00	25.00	900.00
			0.00			1" Ice	29.00	29.00	1050.00
SitePro VFA12-HD	C	From Leg	2.00	0.0000	180.00	No Ice	21.00	21.00	750.00
(T-Mobile)			0.00			1/2" Ice	25.00	25.00	900.00
			0.00			1" Ice	29.00	29.00	1050.00
AIR6449	A	From Leg	4.00	0.0000	180.00	No Ice	5.65	2.42	103.00
(T-Mobile)			-4.00			1/2" Ice	5.96	2.64	141.45
			0.00			1" Ice	6.26	2.87	184.10
APXVAALL24-43	A	From Leg	0.00	0.0000	180.00	No Ice	20.24	8.89	153.00
(T-Mobile)			0.00			1/2" Ice	20.89	9.49	265.59
			0.00			1" Ice	21.54	10.09	386.72
AIR32	A	From Leg	4.00	0.0000	180.00	No Ice	6.51	4.71	133.00
(T-Mobile)			4.00			1/2" Ice	6.89	5.07	178.82
			0.00			1" Ice	7.27	5.43	229.91
AIR6449	B	From Leg	4.00	0.0000	180.00	No Ice	5.65	2.42	103.00
(T-Mobile)			-4.00			1/2" Ice	5.96	2.64	141.45
			0.00			1" Ice	6.26	2.87	184.10
APXVAALL24-43	B	From Leg	0.00	0.0000	180.00	No Ice	20.24	8.89	153.00
(T-Mobile)			0.00			1/2" Ice	20.89	9.49	265.59
			0.00			1" Ice	21.54	10.09	386.72
AIR32	B	From Leg	4.00	0.0000	180.00	No Ice	6.51	4.71	133.00
(T-Mobile)			4.00			1/2" Ice	6.89	5.07	178.82
			0.00			1" Ice	7.27	5.43	229.91
AIR6449	C	From Leg	4.00	0.0000	180.00	No Ice	5.65	2.42	103.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
(T-Mobile)			-4.00			1/2" Ice	5.96	2.64	141.45
			0.00			1" Ice	6.26	2.87	184.10
APXVAALL24-43	C	From Leg	0.00	0.0000	180.00	No Ice	20.24	8.89	153.00
(T-Mobile)			0.00			1/2" Ice	20.89	9.49	265.59
			0.00			1" Ice	21.54	10.09	386.72
AIR32	C	From Leg	4.00	0.0000	180.00	No Ice	6.51	4.71	133.00
(T-Mobile)			4.00			1/2" Ice	6.89	5.07	178.82
			0.00			1" Ice	7.27	5.43	229.91
4449 B12,B71	A	From Leg	4.00	0.0000	180.00	No Ice	1.65	1.16	80.00
(T-Mobile)			0.00			1/2" Ice	1.81	1.29	96.12
			0.00			1" Ice	1.98	1.44	114.85
4449 B12,B71	B	From Leg	4.00	0.0000	180.00	No Ice	1.65	1.16	80.00
(T-Mobile)			0.00			1/2" Ice	1.81	1.29	96.12
			0.00			1" Ice	1.98	1.44	114.85
4449 B12,B71	C	From Leg	4.00	0.0000	180.00	No Ice	1.65	1.16	80.00
(T-Mobile)			0.00			1/2" Ice	1.81	1.29	96.12
			0.00			1" Ice	1.98	1.44	114.85
4415 B25	A	From Leg	4.00	0.0000	180.00	No Ice	1.84	0.82	46.00
(T-Mobile)			0.00			1/2" Ice	2.01	0.94	60.07
			0.00			1" Ice	2.19	1.07	76.66
4415 B25	B	From Leg	4.00	0.0000	180.00	No Ice	1.84	0.82	46.00
(T-Mobile)			0.00			1/2" Ice	2.01	0.94	60.07
			0.00			1" Ice	2.19	1.07	76.66
4415 B25	C	From Leg	4.00	0.0000	180.00	No Ice	1.84	0.82	46.00
(T-Mobile)			0.00			1/2" Ice	2.01	0.94	60.07
			0.00			1" Ice	2.19	1.07	76.66
SDX1926Q-43	A	From Leg	4.00	0.0000	180.00	No Ice	0.24	0.10	30.00
(T-Mobile)			0.00			1/2" Ice	0.31	0.14	32.47
			0.00			1" Ice	0.38	0.19	36.04
SDX1926Q-43	B	From Leg	4.00	0.0000	180.00	No Ice	0.24	0.10	30.00
(T-Mobile)			0.00			1/2" Ice	0.31	0.14	32.47
			0.00			1" Ice	0.38	0.19	36.04
SDX1926Q-43	C	From Leg	4.00	0.0000	180.00	No Ice	0.24	0.10	30.00
(T-Mobile)			0.00			1/2" Ice	0.31	0.14	32.47
			0.00			1" Ice	0.38	0.19	36.04
TMA 10"x8"x3"	A	From Leg	4.00	0.0000	180.00	No Ice	0.67	0.26	15.00
(T-Mobile)			0.00			1/2" Ice	0.77	0.33	20.06
			0.00			1" Ice	0.88	0.41	26.67
TMA 10"x8"x3"	B	From Leg	4.00	0.0000	180.00	No Ice	0.67	0.26	15.00
(T-Mobile)			0.00			1/2" Ice	0.77	0.33	20.06
			0.00			1" Ice	0.88	0.41	26.67
TMA 10"x8"x3"	C	From Leg	4.00	0.0000	180.00	No Ice	0.67	0.26	15.00
(T-Mobile)			0.00			1/2" Ice	0.77	0.33	20.06
			0.00			1" Ice	0.88	0.41	26.67
Pirod 12' T-Frame Sector	A	From Leg	2.00	0.0000	172.00	No Ice	13.60	13.60	465.00
Mount (1)			0.00			1/2" Ice	18.40	18.40	600.00
(AT&T)			0.00			1" Ice	23.20	23.20	735.00
Pirod 12' T-Frame Sector	B	From Leg	2.00	0.0000	172.00	No Ice	13.60	13.60	465.00
Mount (1)			0.00			1/2" Ice	18.40	18.40	600.00
(AT&T)			0.00			1" Ice	23.20	23.20	735.00
Pirod 12' T-Frame Sector	C	From Leg	2.00	0.0000	172.00	No Ice	13.60	13.60	465.00
Mount (1)			0.00			1/2" Ice	18.40	18.40	600.00
(AT&T)			0.00			1" Ice	23.20	23.20	735.00
800 10121	A	From Leg	4.00	0.0000	172.00	No Ice	5.16	3.29	46.30
(AT&T)			4.00			1/2" Ice	5.51	3.64	79.21
			0.00			1" Ice	5.87	3.99	116.89
OPA65R-BU6D	A	From Leg	4.00	0.0000	172.00	No Ice	12.87	5.67	70.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Offsets: Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
(AT&T)			0.00				1/2" Ice	13.37	6.13	145.03
			0.00				1" Ice	13.87	6.59	226.75
DMP65R-BU6D	A	From Leg	4.00	0.0000	172.00		No Ice	12.71	5.62	96.00
(AT&T)			-4.00				1/2" Ice	13.21	6.07	169.96
			0.00				1" Ice	13.71	6.53	250.56
800 10121	B	From Leg	4.00	0.0000	172.00		No Ice	5.16	3.29	46.30
(AT&T)			4.00				1/2" Ice	5.51	3.64	79.21
			0.00				1" Ice	5.87	3.99	116.89
OPA65R-BU6D	B	From Leg	4.00	0.0000	172.00		No Ice	12.87	5.67	70.00
(AT&T)			0.00				1/2" Ice	13.37	6.13	145.03
			0.00				1" Ice	13.87	6.59	226.75
DMP65R-BU6D	B	From Leg	4.00	0.0000	172.00		No Ice	12.71	5.62	96.00
(AT&T)			-4.00				1/2" Ice	13.21	6.07	169.96
			0.00				1" Ice	13.71	6.53	250.56
800 10121	C	From Leg	4.00	0.0000	172.00		No Ice	5.16	3.29	46.30
(AT&T)			4.00				1/2" Ice	5.51	3.64	79.21
			0.00				1" Ice	5.87	3.99	116.89
OPA65R-BU6D	C	From Leg	4.00	0.0000	172.00		No Ice	12.87	5.67	70.00
(AT&T)			0.00				1/2" Ice	13.37	6.13	145.03
			0.00				1" Ice	13.87	6.59	226.75
DMP65R-BU6D	C	From Leg	4.00	0.0000	172.00		No Ice	12.71	5.62	96.00
(AT&T)			-4.00				1/2" Ice	13.21	6.07	169.96
			0.00				1" Ice	13.71	6.53	250.56
(2) LGP21401 TMA	A	From Leg	4.00	0.0000	172.00		No Ice	0.82	0.35	17.50
(AT&T)			5.00				1/2" Ice	0.94	0.44	23.31
			0.00				1" Ice	1.06	0.54	30.86
(2) LGP21401 TMA	B	From Leg	4.00	0.0000	172.00		No Ice	0.82	0.35	17.50
(AT&T)			5.00				1/2" Ice	0.94	0.44	23.31
			0.00				1" Ice	1.06	0.54	30.86
(2) LGP21401 TMA	C	From Leg	4.00	0.0000	172.00		No Ice	0.82	0.35	17.50
(AT&T)			5.00				1/2" Ice	0.94	0.44	23.31
			0.00				1" Ice	1.06	0.54	30.86
DC6-48-60-18-8F Surge	B	From Face	0.50	0.0000	172.00		No Ice	1.91	1.91	20.00
Arrestor			0.50				1/2" Ice	2.10	2.10	39.36
(AT&T)			0.00				1" Ice	2.29	2.29	61.70
DC6-48-60-18-8F Surge	C	From Face	0.50	0.0000	172.00		No Ice	1.91	1.91	20.00
Arrestor			0.50				1/2" Ice	2.10	2.10	39.36
(AT&T)			0.00				1" Ice	2.29	2.29	61.70
4478 B14	A	From Face	4.00	0.0000	172.00		No Ice	1.84	1.06	60.00
(AT&T)			-2.00				1/2" Ice	2.01	1.20	75.88
			0.00				1" Ice	2.19	1.34	94.39
4478 B14	B	From Face	4.00	0.0000	172.00		No Ice	1.84	1.06	60.00
(AT&T)			-2.00				1/2" Ice	2.01	1.20	75.88
			0.00				1" Ice	2.19	1.34	94.39
4478 B14	C	From Face	4.00	0.0000	172.00		No Ice	1.84	1.06	60.00
(AT&T)			-2.00				1/2" Ice	2.01	1.20	75.88
			0.00				1" Ice	2.19	1.34	94.39
4449 B5/B12	A	From Face	4.00	0.0000	172.00		No Ice	1.97	1.41	71.00
(AT&T)			-2.00				1/2" Ice	2.14	1.56	89.51
			0.00				1" Ice	2.33	1.73	110.84
4449 B5/B12	B	From Face	4.00	0.0000	172.00		No Ice	1.97	1.41	71.00
(AT&T)			-2.00				1/2" Ice	2.14	1.56	89.51
			0.00				1" Ice	2.33	1.73	110.84
4449 B5/B12	C	From Face	4.00	0.0000	172.00		No Ice	1.97	1.41	71.00
(AT&T)			-2.00				1/2" Ice	2.14	1.56	89.51
			0.00				1" Ice	2.33	1.73	110.84
8843 B2/B66A	A	From Face	4.00	0.0000	172.00		No Ice	1.64	1.35	72.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
(AT&T)			-2.00			1/2" Ice	1.80	1.50	89.60
			0.00			1" Ice	1.97	1.65	109.91
8843 B2/B66A	B	From Face	4.00	0.0000	172.00	No Ice	1.64	1.35	72.00
(AT&T)			-2.00			1/2" Ice	1.80	1.50	89.60
			0.00			1" Ice	1.97	1.65	109.91
8843 B2/B66A	C	From Face	4.00	0.0000	172.00	No Ice	1.64	1.35	72.00
(AT&T)			-2.00			1/2" Ice	1.80	1.50	89.60
			0.00			1" Ice	1.97	1.65	109.91
Pirod 12' T-Frame Sector	A	From Leg	2.00	0.0000	160.00	No Ice	13.60	13.60	465.00
Mount (1)			0.00			1/2" Ice	18.40	18.40	600.00
(Empty)			0.00			1" Ice	23.20	23.20	735.00
Pirod 12' T-Frame Sector	B	From Leg	2.00	0.0000	160.00	No Ice	13.60	13.60	465.00
Mount (1)			0.00			1/2" Ice	18.40	18.40	600.00
(Empty)			0.00			1" Ice	23.20	23.20	735.00
Pirod 12' T-Frame Sector	C	From Leg	2.00	0.0000	160.00	No Ice	13.60	13.60	465.00
Mount (1)			0.00			1/2" Ice	18.40	18.40	600.00
(Empty)			0.00			1" Ice	23.20	23.20	735.00
Pirod 12' T-Frame Sector	A	From Leg	2.00	0.0000	146.00	No Ice	13.60	13.60	465.00
Mount (1)			0.00			1/2" Ice	18.40	18.40	600.00
(Verizon)			0.00			1" Ice	23.20	23.20	735.00
Pirod 12' T-Frame Sector	B	From Leg	2.00	0.0000	146.00	No Ice	13.60	13.60	465.00
Mount (1)			0.00			1/2" Ice	18.40	18.40	600.00
(Verizon)			0.00			1" Ice	23.20	23.20	735.00
Pirod 12' T-Frame Sector	C	From Leg	2.00	0.0000	146.00	No Ice	13.60	13.60	465.00
Mount (1)			0.00			1/2" Ice	18.40	18.40	600.00
(Verizon)			0.00			1" Ice	23.20	23.20	735.00
SitePro SFS-V-L	A	From Leg	2.00	0.0000	146.00	No Ice	5.09	4.75	77.00
(Verizon Proposed)			0.00			1/2" Ice	5.74	5.35	100.00
			0.00			1" Ice	6.53	6.07	137.00
SitePro SFS-V-L	B	From Leg	2.00	0.0000	146.00	No Ice	5.09	4.75	77.00
(Verizon Proposed)			0.00			1/2" Ice	5.74	5.35	100.00
			0.00			1" Ice	6.53	6.07	137.00
SitePro SFS-V-L	C	From Leg	2.00	0.0000	146.00	No Ice	5.09	4.75	77.00
(Verizon Proposed)			0.00			1/2" Ice	5.74	5.35	100.00
			0.00			1" Ice	6.53	6.07	137.00
LNX-6513DS-VTM	A	From Leg	4.00	0.0000	146.00	No Ice	5.85	3.84	32.00
(Verizon)			-6.00			1/2" Ice	6.21	4.19	70.84
			0.00			1" Ice	6.58	4.54	114.65
(2) JAHH-65B-R3B	A	From Leg	4.00	0.0000	146.00	No Ice	9.11	5.98	63.00
(Verizon Proposed)			0.00			1/2" Ice	9.58	6.44	121.08
			0.00			1" Ice	10.05	6.91	185.45
LNX-6513DS-VTM	B	From Leg	4.00	0.0000	146.00	No Ice	5.85	3.84	32.00
(Verizon)			-6.00			1/2" Ice	6.21	4.19	70.84
			0.00			1" Ice	6.58	4.54	114.65
(2) JAHH-65B-R3B	B	From Leg	4.00	0.0000	146.00	No Ice	9.11	5.98	63.00
(Verizon Proposed)			0.00			1/2" Ice	9.58	6.44	121.08
			0.00			1" Ice	10.05	6.91	185.45
LNX-6513DS-VTM	C	From Leg	4.00	0.0000	146.00	No Ice	5.85	3.84	32.00
(Verizon)			-6.00			1/2" Ice	6.21	4.19	70.84
			0.00			1" Ice	6.58	4.54	114.65
(2) JAHH-65B-R3B	C	From Leg	4.00	0.0000	146.00	No Ice	9.11	5.98	63.00
(Verizon Proposed)			0.00			1/2" Ice	9.58	6.44	121.08
			0.00			1" Ice	10.05	6.91	185.45
B2/B66A RRH	A	From Leg	2.00	0.0000	146.00	No Ice	2.54	1.61	60.00
(Verizon Proposed)			-4.00			1/2" Ice	2.75	1.79	80.12
			0.00			1" Ice	2.97	1.98	103.35
B2/B66A RRH	B	From Leg	2.00	0.0000	146.00	No Ice	2.54	1.61	60.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
(Verizon Proposed)			-4.00			1/2" Ice	2.75	1.79	80.12
			0.00			1" Ice	2.97	1.98	103.35
B2/B66A RRH	C	From Leg	2.00	0.0000	146.00	No Ice	2.54	1.61	60.00
(Verizon Proposed)			-4.00			1/2" Ice	2.75	1.79	80.12
			0.00			1" Ice	2.97	1.98	103.35
B5/B13 RRH	A	From Leg	2.00	0.0000	146.00	No Ice	1.87	1.02	70.00
(Verizon Proposed)			-4.00			1/2" Ice	2.03	1.15	86.42
			0.00			1" Ice	2.21	1.29	105.50
B5/B13 RRH	B	From Leg	2.00	0.0000	146.00	No Ice	1.87	1.02	70.00
(Verizon Proposed)			-4.00			1/2" Ice	2.03	1.15	86.42
			0.00			1" Ice	2.21	1.29	105.50
B5/B13 RRH	C	From Leg	2.00	0.0000	146.00	No Ice	1.87	1.02	70.00
(Verizon Proposed)			-4.00			1/2" Ice	2.03	1.15	86.42
			0.00			1" Ice	2.21	1.29	105.50
RC2DC-3315-PF-48	A	From Leg	2.00	0.0000	146.00	No Ice	3.01	1.96	25.00
(Verizon)			0.00			1/2" Ice	3.23	2.15	51.21
			0.00			1" Ice	3.46	2.35	80.79
CBC78T-DS-43	A	From Leg	4.00	0.0000	146.00	No Ice	0.37	0.26	11.00
(Verizon Proposed)			-6.00			1/2" Ice	0.45	0.32	15.12
			0.00			1" Ice	0.53	0.40	20.61
CBC78T-DS-43	B	From Leg	4.00	0.0000	146.00	No Ice	0.37	0.26	11.00
(Verizon Proposed)			-6.00			1/2" Ice	0.45	0.32	15.12
			0.00			1" Ice	0.53	0.40	20.61
CBC78T-DS-43	C	From Leg	4.00	0.0000	146.00	No Ice	0.37	0.26	11.00
(Verizon Proposed)			-6.00			1/2" Ice	0.45	0.32	15.12
			0.00			1" Ice	0.53	0.40	20.61
RC2DC-3315-PF-48	B	From Leg	2.00	0.0000	146.00	No Ice	3.01	1.96	25.00
(Verizon Proposed)			0.00			1/2" Ice	3.23	2.15	51.21
			0.00			1" Ice	3.46	2.35	80.79
GPS	C	From Leg	2.00	0.0000	80.00	No Ice	1.00	1.00	10.00
(Sprint)			0.00			1/2" Ice	1.50	1.50	15.00
			0.00			1" Ice	2.00	2.00	20.00
2-ft Stand Off	C	From Leg	1.00	0.0000	80.00	No Ice	1.07	1.07	20.00
(Sprint)			0.00			1/2" Ice	1.62	1.62	28.00
			0.00			1" Ice	2.17	2.17	36.00

Tower Pressures - No Ice

$G_H = 0.850$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg %	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
T1	185.00	1.441	32	115.002	A	0.000	18.774	10.004	53.29	6.930	0.000
195.00-175.00					B	0.000	18.774		53.29	0.000	0.000
					C	0.000	18.774		53.29	8.910	0.000
T2	165.00	1.406	31	146.258	A	11.554	12.521	12.521	52.01	29.785	0.000
175.00-155.00					B	11.554	12.521		52.01	0.000	0.000
					C	11.554	12.521		52.01	35.640	0.000

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T3	145.00	1.369	30	186.675	A	13.489	13.356	13.356	49.75	36.028	0.000
155.00-135.00					B	13.489	13.356		49.75	27.720	0.000
					C	13.489	13.356		49.75	35.640	0.000
T4	125.00	1.326	29	227.092	A	18.679	14.190	14.190	43.17	36.028	0.000
135.00-115.00					B	18.679	14.190		43.17	55.440	0.000
					C	18.679	14.190		43.17	35.640	0.000
T5	105.00	1.279	28	267.092	A	21.322	14.190	14.190	39.96	36.028	0.000
115.00-95.00					B	21.322	14.190		39.96	55.440	0.000
					C	21.322	14.190		39.96	35.640	0.000
T6 95.00-75.00	85.00	1.223	27	307.509	A	28.012	15.025	15.025	34.91	36.318	0.000
					B	28.012	15.025		34.91	55.440	0.000
					C	28.012	15.025		34.91	35.640	0.000
T7 75.00-55.00	65.00	1.156	26	347.927	A	35.675	15.860	15.860	30.78	37.188	0.000
					B	35.675	15.860		30.78	55.440	0.000
					C	35.675	15.860		30.78	35.640	0.000
T8 55.00-40.00	47.50	1.082	24	287.195	A	37.993	11.895	11.895	23.84	27.891	0.000
					B	37.993	11.895		23.84	41.580	0.000
					C	37.993	11.895		23.84	26.730	0.000
T9 40.00-20.00	30.00	0.982	22	417.927	A	42.284	15.860	15.860	27.28	37.188	0.000
					B	42.284	15.860		27.28	55.440	0.000
					C	42.284	15.860		27.28	35.640	0.000
T10 20.00-0.00	10.00	0.85	19	458.344	A	46.067	16.694	16.694	26.60	37.188	0.000
					B	46.067	16.694		26.60	55.440	0.000
					C	46.067	16.694		26.60	35.640	0.000

Tower Pressure - With Ice

$G_H = 0.850$

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1	185.00	1.441	8	1.7822	120.944	A	0.000	55.666	21.890	39.32	23.188	0.000
195.00-175.00						B	0.000	55.666		39.32	0.000	0.000
						C	0.000	55.666		39.32	25.316	0.000
T2	165.00	1.406	8	1.7619	152.138	A	11.554	40.572	24.287	46.59	89.611	0.000
175.00-155.00						B	11.554	40.572		46.59	0.000	0.000
						C	11.554	40.572		46.59	101.010	0.000
T3	145.00	1.369	7	1.7393	192.480	A	13.489	43.739	24.970	43.63	102.366	0.000
155.00-135.00						B	13.489	43.739		43.63	72.569	0.000
						C	13.489	43.739		43.63	100.728	0.000
T4	125.00	1.326	7	1.7137	232.812	A	18.679	46.974	25.634	39.04	101.659	0.000
135.00-115.00						B	18.679	46.974		39.04	144.792	0.000
						C	18.679	46.974		39.04	100.409	0.000
T5 115.00-95.00	105.00	1.279	7	1.6841	272.713	A	21.322	49.375	25.436	35.98	100.842	0.000
						B	21.322	49.375		35.98	144.392	0.000
						C	21.322	49.375		35.98	100.040	0.000
T6 95.00-75.00	85.00	1.223	7	1.6489	313.012	A	28.012	52.429	26.036	32.37	101.809	0.000
						B	28.012	52.429		32.37	143.916	0.000
						C	28.012	52.429		32.37	99.602	0.000
T7 75.00-55.00	65.00	1.156	6	1.6052	353.284	A	35.675	55.211	26.579	29.24	106.248	0.000
						B	35.675	55.211		29.24	143.327	0.000
						C	35.675	55.211		29.24	99.061	0.000
T8 55.00-40.00	47.50	1.082	6	1.5556	291.089	A	37.993	49.237	19.686	22.57	78.513	0.000
						B	37.993	49.237		22.57	106.993	0.000

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
						C	37.993	49.237		22.57	73.835	0.000
T9 40.00-20.00	30.00	0.982	5	1.4858	422.885	A	42.284	57.194	25.781	25.92	102.481	0.000
						B	42.284	57.194		25.92	141.715	0.000
						C	42.284	57.194		25.92	97.583	0.000
T10 20.00-0.00	10.00	0.85	5	1.3312	462.787	A	46.067	56.246	25.584	25.01	97.615	0.000
						B	46.067	56.246		25.01	139.633	0.000
						C	46.067	56.246		25.01	95.680	0.000

Tower Pressure - Service

G_H = 0.850

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1	185.00	1.441	11	115.002	A	0.000	18.774	10.004	53.29	6.930	0.000
195.00-175.00					B	0.000	18.774		53.29	0.000	0.000
					C	0.000	18.774		53.29	8.910	0.000
T2	165.00	1.406	11	146.258	A	11.554	12.521	12.521	52.01	29.785	0.000
175.00-155.00					B	11.554	12.521		52.01	0.000	0.000
					C	11.554	12.521		52.01	35.640	0.000
T3	145.00	1.369	11	186.675	A	13.489	13.356	13.356	49.75	36.028	0.000
155.00-135.00					B	13.489	13.356		49.75	27.720	0.000
					C	13.489	13.356		49.75	35.640	0.000
T4	125.00	1.326	10	227.092	A	18.679	14.190	14.190	43.17	36.028	0.000
135.00-115.00					B	18.679	14.190		43.17	55.440	0.000
					C	18.679	14.190		43.17	35.640	0.000
T5	105.00	1.279	10	267.092	A	21.322	14.190	14.190	39.96	36.028	0.000
115.00-95.00					B	21.322	14.190		39.96	55.440	0.000
					C	21.322	14.190		39.96	35.640	0.000
T6 95.00-75.00	85.00	1.223	10	307.509	A	28.012	15.025	15.025	34.91	36.318	0.000
					B	28.012	15.025		34.91	55.440	0.000
					C	28.012	15.025		34.91	35.640	0.000
T7 75.00-55.00	65.00	1.156	9	347.927	A	35.675	15.860	15.860	30.78	37.188	0.000
					B	35.675	15.860		30.78	55.440	0.000
					C	35.675	15.860		30.78	35.640	0.000
T8 55.00-40.00	47.50	1.082	8	287.195	A	37.993	11.895	11.895	23.84	27.891	0.000
					B	37.993	11.895		23.84	41.580	0.000
					C	37.993	11.895		23.84	26.730	0.000
T9 40.00-20.00	30.00	0.982	8	417.927	A	42.284	15.860	15.860	27.28	37.188	0.000
					B	42.284	15.860		27.28	55.440	0.000
					C	42.284	15.860		27.28	35.640	0.000
T10 20.00-0.00	10.00	0.85	7	458.344	A	46.067	16.694	16.694	26.60	37.188	0.000
					B	46.067	16.694		26.60	55.440	0.000
					C	46.067	16.694		26.60	35.640	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
T1	118.20	2548.67	A	0.163	2.723	32	1	1	10.683	1049.10	52.45	C
195.00-175.00			B	0.163	2.723		1	1	10.683			
			C	0.163	2.723		1	1	10.683			
T2	450.00	2793.29	A	0.165	2.718	31	1	1	18.377	2367.18	118.36	C
175.00-155.00			B	0.165	2.718		1	1	18.377			
			C	0.165	2.718		1	1	18.377			
T3	648.40	3572.06	A	0.144	2.794	30	1	1	20.594	3025.90	151.29	C
155.00-135.00			B	0.144	2.794		1	1	20.594			
			C	0.144	2.794		1	1	20.594			
T4	811.20	4036.07	A	0.145	2.791	29	1	1	26.109	3732.53	186.63	C
135.00-115.00			B	0.145	2.791		1	1	26.109			
			C	0.145	2.791		1	1	26.109			
T5	811.20	4789.76	A	0.133	2.835	28	1	1	28.771	3807.93	190.40	C
115.00-95.00			B	0.133	2.835		1	1	28.771			
			C	0.133	2.835		1	1	28.771			
T6	812.45	5354.18	A	0.14	2.809	27	1	1	35.815	4085.34	204.27	C
95.00-75.00			B	0.14	2.809		1	1	35.815			
			C	0.14	2.809		1	1	35.815			
T7	816.20	5794.03	A	0.148	2.778	26	1	1	43.858	4336.04	216.80	C
75.00-55.00			B	0.148	2.778		1	1	43.858			
			C	0.148	2.778		1	1	43.858			
T8	612.15	5023.91	A	0.174	2.686	24	1	1	44.281	3606.74	240.45	C
55.00-40.00			B	0.174	2.686		1	1	44.281			
			C	0.174	2.686		1	1	44.281			
T9	816.20	6793.06	A	0.139	2.812	22	1	1	50.690	4067.92	203.40	C
40.00-20.00			B	0.139	2.812		1	1	50.690			
			C	0.139	2.812		1	1	50.690			
T10	816.20	8126.54	A	0.137	2.82	19	1	1	54.975	3720.72	186.04	C
20.00-0.00			B	0.137	2.82		1	1	54.975			
			C	0.137	2.82		1	1	54.975			
Sum Weight:	6712.20	48831.58						OTM	2849482.8 9 lb-ft	33799.39		

Tower Forces - No Ice - Wind 45 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
T1	118.20	2548.67	A	0.163	2.723	32	0.825	1	10.683	1049.10	52.45	C
195.00-175.00			B	0.163	2.723		0.825	1	10.683			
			C	0.163	2.723		0.825	1	10.683			
T2	450.00	2793.29	A	0.165	2.718	31	0.825	1	16.355	2221.34	111.07	C
175.00-155.00			B	0.165	2.718		0.825	1	16.355			
			C	0.165	2.718		0.825	1	16.355			
T3	648.40	3572.06	A	0.144	2.794	30	0.825	1	18.233	2855.56	142.78	C
155.00-135.00			B	0.144	2.794		0.825	1	18.233			
			C	0.144	2.794		0.825	1	18.233			
T4	811.20	4036.07	A	0.145	2.791	29	0.825	1	22.840	3504.20	175.21	C
135.00-115.00			B	0.145	2.791		0.825	1	22.840			
			C	0.145	2.791		0.825	1	22.840			
T5	811.20	4789.76	A	0.133	2.835	28	0.825	1	25.039	3552.69	177.63	C
115.00-95.00			B	0.133	2.835		0.825	1	25.039			
			C	0.133	2.835		0.825	1	25.039			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
T6	812.45	5354.18	A	0.14	2.809	27	0.825	1	30.913	3767.60	188.38	C
95.00-75.00			B	0.14	2.809		0.825	1	30.913			
			C	0.14	2.809		0.825	1	30.913			
T7	816.20	5794.03	A	0.148	2.778	26	0.825	1	37.615	3957.74	197.89	C
75.00-55.00			B	0.148	2.778		0.825	1	37.615			
			C	0.148	2.778		0.825	1	37.615			
T8	612.15	5023.91	A	0.174	2.686	24	0.825	1	37.632	3242.12	216.14	C
55.00-40.00			B	0.174	2.686		0.825	1	37.632			
			C	0.174	2.686		0.825	1	37.632			
T9	816.20	6793.06	A	0.139	2.812	22	0.825	1	43.290	3682.29	184.11	C
40.00-20.00			B	0.139	2.812		0.825	1	43.290			
			C	0.139	2.812		0.825	1	43.290			
T10	816.20	8126.54	A	0.137	2.82	19	0.825	1	46.913	3356.10	167.80	C
20.00-0.00			B	0.137	2.82		0.825	1	46.913			
			C	0.137	2.82		0.825	1	46.913			
Sum Weight:	6712.20	48831.58						OTM	2661247.7 3 lb-ft	31188.75		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
T1	118.20	2548.67	A	0.163	2.723	32	0.8	1	10.683	1049.10	52.45	C
195.00-175.00			B	0.163	2.723		0.8	1	10.683			
			C	0.163	2.723		0.8	1	10.683			
T2	450.00	2793.29	A	0.165	2.718	31	0.8	1	16.066	2200.50	110.03	C
175.00-155.00			B	0.165	2.718		0.8	1	16.066			
			C	0.165	2.718		0.8	1	16.066			
T3	648.40	3572.06	A	0.144	2.794	30	0.8	1	17.896	2831.23	141.56	C
155.00-135.00			B	0.144	2.794		0.8	1	17.896			
			C	0.144	2.794		0.8	1	17.896			
T4	811.20	4036.07	A	0.145	2.791	29	0.8	1	22.373	3471.58	173.58	C
135.00-115.00			B	0.145	2.791		0.8	1	22.373			
			C	0.145	2.791		0.8	1	22.373			
T5	811.20	4789.76	A	0.133	2.835	28	0.8	1	24.506	3516.23	175.81	C
115.00-95.00			B	0.133	2.835		0.8	1	24.506			
			C	0.133	2.835		0.8	1	24.506			
T6	812.45	5354.18	A	0.14	2.809	27	0.8	1	30.213	3722.21	186.11	C
95.00-75.00			B	0.14	2.809		0.8	1	30.213			
			C	0.14	2.809		0.8	1	30.213			
T7	816.20	5794.03	A	0.148	2.778	26	0.8	1	36.723	3903.70	195.18	C
75.00-55.00			B	0.148	2.778		0.8	1	36.723			
			C	0.148	2.778		0.8	1	36.723			
T8	612.15	5023.91	A	0.174	2.686	24	0.8	1	36.682	3190.04	212.67	C
55.00-40.00			B	0.174	2.686		0.8	1	36.682			
			C	0.174	2.686		0.8	1	36.682			
T9	816.20	6793.06	A	0.139	2.812	22	0.8	1	42.233	3627.20	181.36	C
40.00-20.00			B	0.139	2.812		0.8	1	42.233			
			C	0.139	2.812		0.8	1	42.233			
T10	816.20	8126.54	A	0.137	2.82	19	0.8	1	45.762	3304.01	165.20	C
20.00-0.00			B	0.137	2.82		0.8	1	45.762			
			C	0.137	2.82		0.8	1	45.762			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
Sum Weight:	6712.20	48831.58						OTM	2634356.99 lb-ft	30815.80		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
T1	118.20	2548.67	A	0.163	2.723	32	0.85	1	10.683	1049.10	52.45	C
195.00-175.00			B	0.163	2.723		0.85	1	10.683			
			C	0.163	2.723		0.85	1	10.683			
T2	450.00	2793.29	A	0.165	2.718	31	0.85	1	16.644	2242.17	112.11	C
175.00-155.00			B	0.165	2.718		0.85	1	16.644			
			C	0.165	2.718		0.85	1	16.644			
T3	648.40	3572.06	A	0.144	2.794	30	0.85	1	18.571	2879.90	143.99	C
155.00-135.00			B	0.144	2.794		0.85	1	18.571			
			C	0.144	2.794		0.85	1	18.571			
T4	811.20	4036.07	A	0.145	2.791	29	0.85	1	23.307	3536.82	176.84	C
135.00-115.00			B	0.145	2.791		0.85	1	23.307			
			C	0.145	2.791		0.85	1	23.307			
T5	811.20	4789.76	A	0.133	2.835	28	0.85	1	25.572	3589.15	179.46	C
115.00-95.00			B	0.133	2.835		0.85	1	25.572			
			C	0.133	2.835		0.85	1	25.572			
T6	812.45	5354.18	A	0.14	2.809	27	0.85	1	31.613	3812.99	190.65	C
95.00-75.00			B	0.14	2.809		0.85	1	31.613			
			C	0.14	2.809		0.85	1	31.613			
T7	816.20	5794.03	A	0.148	2.778	26	0.85	1	38.507	4011.78	200.59	C
75.00-55.00			B	0.148	2.778		0.85	1	38.507			
			C	0.148	2.778		0.85	1	38.507			
T8	612.15	5023.91	A	0.174	2.686	24	0.85	1	38.582	3294.21	219.61	C
55.00-40.00			B	0.174	2.686		0.85	1	38.582			
			C	0.174	2.686		0.85	1	38.582			
T9	816.20	6793.06	A	0.139	2.812	22	0.85	1	44.347	3737.38	186.87	C
40.00-20.00			B	0.139	2.812		0.85	1	44.347			
			C	0.139	2.812		0.85	1	44.347			
T10	816.20	8126.54	A	0.137	2.82	19	0.85	1	48.065	3408.19	170.41	C
20.00-0.00			B	0.137	2.82		0.85	1	48.065			
			C	0.137	2.82		0.85	1	48.065			
Sum Weight:	6712.20	48831.58						OTM	2688138.47 lb-ft	31561.70		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
T1	727.24	4920.60	A	0.46	1.957	8	1	1	36.982	656.50	32.83	C

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
195.00-175.00			B	0.46	1.957		1	1	36.982			
			C	0.46	1.957		1	1	36.982			
T2	2958.81	5492.44	A	0.343	2.189	8	1	1	36.438	1262.39	63.12	C
175.00-155.00			B	0.343	2.189		1	1	36.438			
			C	0.343	2.189		1	1	36.438			
T3	4376.85	6566.06	A	0.297	2.303	7	1	1	39.649	1624.59	81.23	C
155.00-135.00			B	0.297	2.303		1	1	39.649			
			C	0.297	2.303		1	1	39.649			
T4	5505.02	7674.74	A	0.282	2.345	7	1	1	46.559	1946.20	97.31	C
135.00-115.00			B	0.282	2.345		1	1	46.559			
			C	0.282	2.345		1	1	46.559			
T5	5430.58	8731.00	A	0.259	2.41	7	1	1	50.321	1941.96	97.10	C
115.00-95.00			B	0.259	2.41		1	1	50.321			
			C	0.259	2.41		1	1	50.321			
T6	5366.29	10026.74	A	0.257	2.417	7	1	1	58.774	1975.06	98.75	C
95.00-75.00			B	0.257	2.417		1	1	58.774			
			C	0.257	2.417		1	1	58.774			
T7	5325.00	11224.75	A	0.257	2.416	6	1	1	68.073	1997.04	99.85	C
75.00-55.00			B	0.257	2.416		1	1	68.073			
			C	0.257	2.416		1	1	68.073			
T8	3898.86	10352.39	A	0.3	2.297	6	1	1	67.477	1553.98	103.60	C
55.00-40.00			B	0.3	2.297		1	1	67.477			
			C	0.3	2.297		1	1	67.477			
T9	5022.18	12504.55	A	0.235	2.483	5	1	1	75.544	1783.20	89.16	C
40.00-20.00			B	0.235	2.483		1	1	75.544			
			C	0.235	2.483		1	1	75.544			
T10	4640.61	13546.27	A	0.221	2.527	5	1	1	78.605	1565.87	78.29	C
20.00-0.00			B	0.221	2.527		1	1	78.605			
			C	0.221	2.527		1	1	78.605			
Sum Weight:	43251.46	91039.54						OTM	1453151.2 4 lb-ft	16306.80		

Tower Forces - With Ice - Wind 45 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
T1	727.24	4920.60	A	0.46	1.957	8	0.825	1	36.982	656.50	32.83	C
195.00-175.00			B	0.46	1.957		0.825	1	36.982			
			C	0.46	1.957		0.825	1	36.982			
T2	2958.81	5492.44	A	0.343	2.189	8	0.825	1	34.416	1233.61	61.68	C
175.00-155.00			B	0.343	2.189		0.825	1	34.416			
			C	0.343	2.189		0.825	1	34.416			
T3	4376.85	6566.06	A	0.297	2.303	7	0.825	1	37.288	1590.19	79.51	C
155.00-135.00			B	0.297	2.303		0.825	1	37.288			
			C	0.297	2.303		0.825	1	37.288			
T4	5505.02	7674.74	A	0.282	2.345	7	0.825	1	43.290	1899.18	94.96	C
135.00-115.00			B	0.282	2.345		0.825	1	43.290			
			C	0.282	2.345		0.825	1	43.290			
T5	5430.58	8731.00	A	0.259	2.41	7	0.825	1	46.590	1888.79	94.44	C
115.00-95.00			B	0.259	2.41		0.825	1	46.590			
			C	0.259	2.41		0.825	1	46.590			
T6	5366.29	10026.74	A	0.257	2.417	7	0.825	1	53.872	1908.06	95.40	C

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
95.00-75.00			B	0.257	2.417		0.825	1	53.872			
			C	0.257	2.417		0.825	1	53.872			
T7	5325.00	11224.75	A	0.257	2.416	6	0.825	1	61.830	1916.43	95.82	C
75.00-55.00			B	0.257	2.416		0.825	1	61.830			
			C	0.257	2.416		0.825	1	61.830			
T8	3898.86	10352.39	A	0.3	2.297	6	0.825	1	60.828	1477.57	98.50	C
55.00-40.00			B	0.3	2.297		0.825	1	60.828			
			C	0.3	2.297		0.825	1	60.828			
T9	5022.18	12504.55	A	0.235	2.483	5	0.825	1	68.144	1699.76	84.99	C
40.00-20.00			B	0.235	2.483		0.825	1	68.144			
			C	0.235	2.483		0.825	1	68.144			
T10	4640.61	13546.27	A	0.221	2.527	5	0.825	1	70.543	1485.80	74.29	C
20.00-0.00			B	0.221	2.527		0.825	1	70.543			
			C	0.221	2.527		0.825	1	70.543			
Sum Weight:	43251.46	91039.54						OTM	1414085.8 7 lb-ft	15755.90		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
T1	727.24	4920.60	A	0.46	1.957	8	0.8	1	36.982	656.50	32.83	C
195.00-175.00			B	0.46	1.957		0.8	1	36.982			
			C	0.46	1.957		0.8	1	36.982			
T2	2958.81	5492.44	A	0.343	2.189	8	0.8	1	34.127	1229.50	61.48	C
175.00-155.00			B	0.343	2.189		0.8	1	34.127			
			C	0.343	2.189		0.8	1	34.127			
T3	4376.85	6566.06	A	0.297	2.303	7	0.8	1	36.951	1585.27	79.26	C
155.00-135.00			B	0.297	2.303		0.8	1	36.951			
			C	0.297	2.303		0.8	1	36.951			
T4	5505.02	7674.74	A	0.282	2.345	7	0.8	1	42.823	1892.47	94.62	C
135.00-115.00			B	0.282	2.345		0.8	1	42.823			
			C	0.282	2.345		0.8	1	42.823			
T5	5430.58	8731.00	A	0.259	2.41	7	0.8	1	46.057	1881.19	94.06	C
115.00-95.00			B	0.259	2.41		0.8	1	46.057			
			C	0.259	2.41		0.8	1	46.057			
T6	5366.29	10026.74	A	0.257	2.417	7	0.8	1	53.172	1898.49	94.92	C
95.00-75.00			B	0.257	2.417		0.8	1	53.172			
			C	0.257	2.417		0.8	1	53.172			
T7	5325.00	11224.75	A	0.257	2.416	6	0.8	1	60.939	1904.91	95.25	C
75.00-55.00			B	0.257	2.416		0.8	1	60.939			
			C	0.257	2.416		0.8	1	60.939			
T8	3898.86	10352.39	A	0.3	2.297	6	0.8	1	59.878	1466.66	97.78	C
55.00-40.00			B	0.3	2.297		0.8	1	59.878			
			C	0.3	2.297		0.8	1	59.878			
T9	5022.18	12504.55	A	0.235	2.483	5	0.8	1	67.087	1687.84	84.39	C
40.00-20.00			B	0.235	2.483		0.8	1	67.087			
			C	0.235	2.483		0.8	1	67.087			
T10	4640.61	13546.27	A	0.221	2.527	5	0.8	1	69.391	1474.36	73.72	C
20.00-0.00			B	0.221	2.527		0.8	1	69.391			
			C	0.221	2.527		0.8	1	69.391			
Sum Weight:	43251.46	91039.54						OTM	1408505.1	15677.20		

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
									1 lb-ft			

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
T1	727.24	4920.60	A	0.46	1.957	8	0.85	1	36.982	656.50	32.83	C
195.00-175.00			B	0.46	1.957		0.85	1	36.982			
			C	0.46	1.957		0.85	1	36.982			
T2	2958.81	5492.44	A	0.343	2.189	8	0.85	1	34.705	1237.72	61.89	C
175.00-155.00			B	0.343	2.189		0.85	1	34.705			
			C	0.343	2.189		0.85	1	34.705			
T3	4376.85	6566.06	A	0.297	2.303	7	0.85	1	37.625	1595.10	79.76	C
155.00-135.00			B	0.297	2.303		0.85	1	37.625			
			C	0.297	2.303		0.85	1	37.625			
T4	5505.02	7674.74	A	0.282	2.345	7	0.85	1	43.757	1905.90	95.29	C
135.00-115.00			B	0.282	2.345		0.85	1	43.757			
			C	0.282	2.345		0.85	1	43.757			
T5	5430.58	8731.00	A	0.259	2.41	7	0.85	1	47.123	1896.38	94.82	C
115.00-95.00			B	0.259	2.41		0.85	1	47.123			
			C	0.259	2.41		0.85	1	47.123			
T6	5366.29	10026.74	A	0.257	2.417	7	0.85	1	54.573	1917.64	95.88	C
95.00-75.00			B	0.257	2.417		0.85	1	54.573			
			C	0.257	2.417		0.85	1	54.573			
T7	5325.00	11224.75	A	0.257	2.416	6	0.85	1	62.722	1927.94	96.40	C
75.00-55.00			B	0.257	2.416		0.85	1	62.722			
			C	0.257	2.416		0.85	1	62.722			
T8	3898.86	10352.39	A	0.3	2.297	6	0.85	1	61.778	1488.49	99.23	C
55.00-40.00			B	0.3	2.297		0.85	1	61.778			
			C	0.3	2.297		0.85	1	61.778			
T9	5022.18	12504.55	A	0.235	2.483	5	0.85	1	69.201	1711.68	85.58	C
40.00-20.00			B	0.235	2.483		0.85	1	69.201			
			C	0.235	2.483		0.85	1	69.201			
T10	4640.61	13546.27	A	0.221	2.527	5	0.85	1	71.695	1497.23	74.86	C
20.00-0.00			B	0.221	2.527		0.85	1	71.695			
			C	0.221	2.527		0.85	1	71.695			
Sum Weight:	43251.46	91039.54						OTM	1419666.64 lb-ft	15834.60		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
T1	118.20	2548.67	A	0.163	2.723	11	1	1	10.683	370.23	18.51	C
195.00-175.00			B	0.163	2.723		1	1	10.683			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
			C	0.163	2.723		1	1	10.683			
T2	450.00	2793.29	A	0.165	2.718	11	1	1	18.680	843.12	42.16	C
175.00-155.00			B	0.165	2.718		1	1	18.680			
			C	0.165	2.718		1	1	18.680			
T3	648.40	3572.06	A	0.144	2.794	11	1	1	21.061	1079.74	53.99	C
155.00-135.00			B	0.144	2.794		1	1	21.061			
			C	0.144	2.794		1	1	21.061			
T4	811.20	4036.07	A	0.145	2.791	10	1	1	26.725	1332.42	66.62	C
135.00-115.00			B	0.145	2.791		1	1	26.725			
			C	0.145	2.791		1	1	26.725			
T5	811.20	4789.76	A	0.133	2.835	10	1	1	29.354	1357.93	67.90	C
115.00-95.00			B	0.133	2.835		1	1	29.354			
			C	0.133	2.835		1	1	29.354			
T6	812.45	5354.18	A	0.14	2.809	10	1	1	36.525	1457.98	72.90	C
95.00-75.00			B	0.14	2.809		1	1	36.525			
			C	0.14	2.809		1	1	36.525			
T7	816.20	5794.03	A	0.148	2.778	9	1	1	44.673	1547.63	77.38	C
75.00-55.00			B	0.148	2.778		1	1	44.673			
			C	0.148	2.778		1	1	44.673			
T8	612.15	5023.91	A	0.174	2.686	8	1	1	44.777	1282.44	85.50	C
55.00-40.00			B	0.174	2.686		1	1	44.777			
			C	0.174	2.686		1	1	44.777			
T9	816.20	6793.06	A	0.139	2.812	8	1	1	51.269	1446.24	72.31	C
40.00-20.00			B	0.139	2.812		1	1	51.269			
			C	0.139	2.812		1	1	51.269			
T10	816.20	8126.54	A	0.137	2.82	7	1	1	55.522	1321.80	66.09	C
20.00-0.00			B	0.137	2.82		1	1	55.522			
			C	0.137	2.82		1	1	55.522			
Sum Weight:	6712.20	48831.58						OTM	1015351.7 1 lb-ft	12039.54		

Tower Forces - Service - Wind 45 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	118.20	2548.67	A	0.163	2.723	11	0.825	1	10.683	370.23	18.51	C
195.00-175.00			B	0.163	2.723		0.825	1	10.683			
			C	0.163	2.723		0.825	1	10.683			
T2	450.00	2793.29	A	0.165	2.718	11	0.825	1	16.658	791.65	39.58	C
175.00-155.00			B	0.165	2.718		0.825	1	16.658			
			C	0.165	2.718		0.825	1	16.658			
T3	648.40	3572.06	A	0.144	2.794	11	0.825	1	18.700	1019.63	50.98	C
155.00-135.00			B	0.144	2.794		0.825	1	18.700			
			C	0.144	2.794		0.825	1	18.700			
T4	811.20	4036.07	A	0.145	2.791	10	0.825	1	23.456	1251.84	62.59	C
135.00-115.00			B	0.145	2.791		0.825	1	23.456			
			C	0.145	2.791		0.825	1	23.456			
T5	811.20	4789.76	A	0.133	2.835	10	0.825	1	25.623	1267.86	63.39	C
115.00-95.00			B	0.133	2.835		0.825	1	25.623			
			C	0.133	2.835		0.825	1	25.623			
T6	812.45	5354.18	A	0.14	2.809	10	0.825	1	31.623	1345.85	67.29	C
95.00-75.00			B	0.14	2.809		0.825	1	31.623			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
			C	0.14	2.809		0.825	1	31.623			
T7	816.20	5794.03	A	0.148	2.778	9	0.825	1	38.430	1414.13	70.71	C
75.00-55.00			B	0.148	2.778		0.825	1	38.430			
			C	0.148	2.778		0.825	1	38.430			
T8	612.15	5023.91	A	0.174	2.686	8	0.825	1	38.128	1153.77	76.92	C
55.00-40.00			B	0.174	2.686		0.825	1	38.128			
			C	0.174	2.686		0.825	1	38.128			
T9	816.20	6793.06	A	0.139	2.812	8	0.825	1	43.869	1310.16	65.51	C
40.00-20.00			B	0.139	2.812		0.825	1	43.869			
			C	0.139	2.812		0.825	1	43.869			
T10	816.20	8126.54	A	0.137	2.82	7	0.825	1	47.460	1193.12	59.66	C
20.00-0.00			B	0.137	2.82		0.825	1	47.460			
			C	0.137	2.82		0.825	1	47.460			
Sum Weight:	6712.20	48831.58						OTM	948922.29 lb-ft	11118.23		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
T1	118.20	2548.67	A	0.163	2.723	11	0.8	1	10.683	370.23	18.51	C
195.00-175.00			B	0.163	2.723		0.8	1	10.683			
			C	0.163	2.723		0.8	1	10.683			
T2	450.00	2793.29	A	0.165	2.718	11	0.8	1	16.370	784.30	39.22	C
175.00-155.00			B	0.165	2.718		0.8	1	16.370			
			C	0.165	2.718		0.8	1	16.370			
T3	648.40	3572.06	A	0.144	2.794	11	0.8	1	18.363	1011.04	50.55	C
155.00-135.00			B	0.144	2.794		0.8	1	18.363			
			C	0.144	2.794		0.8	1	18.363			
T4	811.20	4036.07	A	0.145	2.791	10	0.8	1	22.989	1240.33	62.02	C
135.00-115.00			B	0.145	2.791		0.8	1	22.989			
			C	0.145	2.791		0.8	1	22.989			
T5	811.20	4789.76	A	0.133	2.835	10	0.8	1	25.090	1254.99	62.75	C
115.00-95.00			B	0.133	2.835		0.8	1	25.090			
			C	0.133	2.835		0.8	1	25.090			
T6	812.45	5354.18	A	0.14	2.809	10	0.8	1	30.923	1329.83	66.49	C
95.00-75.00			B	0.14	2.809		0.8	1	30.923			
			C	0.14	2.809		0.8	1	30.923			
T7	816.20	5794.03	A	0.148	2.778	9	0.8	1	37.538	1395.05	69.75	C
75.00-55.00			B	0.148	2.778		0.8	1	37.538			
			C	0.148	2.778		0.8	1	37.538			
T8	612.15	5023.91	A	0.174	2.686	8	0.8	1	37.179	1135.39	75.69	C
55.00-40.00			B	0.174	2.686		0.8	1	37.179			
			C	0.174	2.686		0.8	1	37.179			
T9	816.20	6793.06	A	0.139	2.812	8	0.8	1	42.812	1290.71	64.54	C
40.00-20.00			B	0.139	2.812		0.8	1	42.812			
			C	0.139	2.812		0.8	1	42.812			
T10	816.20	8126.54	A	0.137	2.82	7	0.8	1	46.308	1174.74	58.74	C
20.00-0.00			B	0.137	2.82		0.8	1	46.308			
			C	0.137	2.82		0.8	1	46.308			
Sum Weight:	6712.20	48831.58						OTM	939432.37 lb-ft	10986.61		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
T1	118.20	2548.67	A	0.163	2.723	11	0.85	1	10.683	370.23	18.51	C
195.00-175.00			B	0.163	2.723		0.85	1	10.683			
			C	0.163	2.723		0.85	1	10.683			
T2	450.00	2793.29	A	0.165	2.718	11	0.85	1	16.947	799.01	39.95	C
175.00-155.00			B	0.165	2.718		0.85	1	16.947			
			C	0.165	2.718		0.85	1	16.947			
T3	648.40	3572.06	A	0.144	2.794	11	0.85	1	19.037	1028.22	51.41	C
155.00-135.00			B	0.144	2.794		0.85	1	19.037			
			C	0.144	2.794		0.85	1	19.037			
T4	811.20	4036.07	A	0.145	2.791	10	0.85	1	23.923	1263.35	63.17	C
135.00-115.00			B	0.145	2.791		0.85	1	23.923			
			C	0.145	2.791		0.85	1	23.923			
T5	811.20	4789.76	A	0.133	2.835	10	0.85	1	26.156	1280.73	64.04	C
115.00-95.00			B	0.133	2.835		0.85	1	26.156			
			C	0.133	2.835		0.85	1	26.156			
T6	812.45	5354.18	A	0.14	2.809	10	0.85	1	32.323	1361.87	68.09	C
95.00-75.00			B	0.14	2.809		0.85	1	32.323			
			C	0.14	2.809		0.85	1	32.323			
T7	816.20	5794.03	A	0.148	2.778	9	0.85	1	39.321	1433.20	71.66	C
75.00-55.00			B	0.148	2.778		0.85	1	39.321			
			C	0.148	2.778		0.85	1	39.321			
T8	612.15	5023.91	A	0.174	2.686	8	0.85	1	39.078	1172.15	78.14	C
55.00-40.00			B	0.174	2.686		0.85	1	39.078			
			C	0.174	2.686		0.85	1	39.078			
T9	816.20	6793.06	A	0.139	2.812	8	0.85	1	44.926	1329.60	66.48	C
40.00-20.00			B	0.139	2.812		0.85	1	44.926			
			C	0.139	2.812		0.85	1	44.926			
T10	816.20	8126.54	A	0.137	2.82	7	0.85	1	48.612	1211.50	60.58	C
20.00-0.00			B	0.137	2.82		0.85	1	48.612			
			C	0.137	2.82		0.85	1	48.612			
Sum Weight:	6712.20	48831.58						OTM	958412.21 lb-ft	11249.85		

Force Totals

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Overturning Moments, M_x lb-ft	Sum of Overturning Moments, M_z lb-ft	Sum of Torques lb-ft
Leg Weight	29308.81					
Bracing Weight	19522.77					
Total Member Self-Weight	48831.58			-9411.68	14586.23	
Total Weight	69330.68			-9411.68	14586.23	
Wind 0 deg - No Ice		-9.41	-47256.84	-5162155.89	15959.94	-25855.43
Wind 30 deg - No Ice		22495.99	-38983.02	-4331403.84	-2479130.88	-38974.90
Wind 45 deg - No Ice		31555.29	-31562.97	-3518878.33	-3493758.80	-41735.08

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Overturning Moments, M_x lb-ft	Sum of Overturning Moments, M_z lb-ft	Sum of Torques lb-ft
Wind 60 deg - No Ice		38327.64	-22128.47	-2477031.17	-4259456.10	-41651.08
Wind 90 deg - No Ice		45008.28	9.41	-8037.97	-4975227.33	-33166.89
Wind 120 deg - No Ice		40920.92	23636.57	2568150.09	-4447134.30	-15795.65
Wind 135 deg - No Ice		32623.46	32631.14	3578056.18	-3571760.00	-5169.98
Wind 150 deg - No Ice		22512.29	38992.43	4313954.19	-2481510.22	5808.02
Wind 180 deg - No Ice		9.41	44273.25	4928206.63	13212.52	25855.43
Wind 210 deg - No Ice		-22495.99	38983.02	4312580.48	2508303.34	38974.90
Wind 225 deg - No Ice		-31555.29	31562.97	3500054.97	3522931.26	41735.08
Wind 240 deg - No Ice		-40911.51	23620.27	2565770.76	4474933.05	41651.08
Wind 270 deg - No Ice		-45008.28	-9.41	-10785.39	5004399.79	33166.89
Wind 300 deg - No Ice		-38337.05	-22144.77	-2479410.50	4290002.27	15795.65
Wind 315 deg - No Ice		-31568.60	-31576.28	-3520821.05	3524873.97	5169.98
Wind 330 deg - No Ice		-22512.29	-38992.43	-4332777.55	2510682.68	-5808.02
Member Ice	42207.96					
Total Weight Ice	165632.05			-114824.57	83929.99	
Wind 0 deg - Ice		-2.54	-21579.42	-2464373.20	84300.62	-19051.11
Wind 30 deg - Ice		10549.95	-18278.12	-2120409.55	-1073567.07	-26974.91
Wind 45 deg - Ice		14865.54	-14867.61	-1748320.88	-1549263.70	-28286.71
Wind 60 deg - Ice		18139.27	-10472.71	-1266954.85	-1911618.18	-27670.81
Wind 90 deg - Ice		21104.29	2.54	-114453.94	-2231706.07	-20952.33
Wind 120 deg - Ice		18687.06	10791.91	1060270.72	-1950653.50	-8619.69
Wind 135 deg - Ice		15091.73	15093.80	1534980.68	-1565572.64	-1344.36
Wind 150 deg - Ice		10554.34	18280.66	1891131.03	-1074209.01	6022.58
Wind 180 deg - Ice		2.54	20949.82	2190077.92	83559.36	19051.11
Wind 210 deg - Ice		-10549.95	18278.12	1890760.40	1241427.05	26974.91
Wind 225 deg - Ice		-14865.54	14867.61	1518671.74	1717123.68	28286.71
Wind 240 deg - Ice		-18684.52	10787.51	1059628.77	2118142.85	27670.81
Wind 270 deg - Ice		-21104.29	-2.54	-115195.20	2399566.06	20952.33
Wind 300 deg - Ice		-18141.81	-10477.11	-1267596.80	2079848.79	8619.69
Wind 315 deg - Ice		-14869.13	-14871.20	-1748845.03	1717647.83	1344.36
Wind 330 deg - Ice		-10554.34	-18280.66	-2120780.17	1242069.00	-6022.58
Total Weight	69330.68			-9411.68	14586.23	
Wind 0 deg - Service		-3.32	-16788.76	-1819374.24	562.22	-9124.55
Wind 30 deg - Service		7994.74	-13853.94	-1524890.07	-884846.97	-13754.50
Wind 45 deg - Service		11214.92	-11217.63	-1236594.94	-1244935.22	-14728.58
Wind 60 deg - Service		13622.65	-7865.04	-866900.84	-1516704.37	-14698.94
Wind 90 deg - Service		15995.23	3.32	9298.33	-1770611.06	-11704.81
Wind 120 deg - Service		14537.84	8397.26	923327.28	-1582937.24	-5574.39
Wind 135 deg - Service		11591.89	11594.60	1281749.16	-1272462.36	-1824.52
Wind 150 deg - Service		8000.49	13857.26	1543001.94	-885686.66	2049.69
Wind 180 deg - Service		3.32	15735.84	1761081.98	-407.36	9124.55
Wind 210 deg - Service		-7994.74	13853.94	1542517.15	885001.83	13754.50
Wind 225 deg - Service		-11214.92	11217.63	1254222.03	1245090.08	14728.58
Wind 240 deg - Service		-14534.52	8391.51	922487.59	1582607.31	14698.94
Wind 270 deg - Service		-15995.23	-3.32	8328.75	1770765.92	11704.81
Wind 300 deg - Service		-13625.97	-7870.79	-867740.52	1517344.02	5574.39
Wind 315 deg - Service		-11219.62	-11222.33	-1237280.54	1245775.68	1824.52
Wind 330 deg - Service		-8000.49	-13857.26	-1525374.86	885841.51	-2049.69

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice

Comb. No.	Description
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 45 deg - No Ice
7	0.9 Dead+1.6 Wind 45 deg - No Ice
8	1.2 Dead+1.6 Wind 60 deg - No Ice
9	0.9 Dead+1.6 Wind 60 deg - No Ice
10	1.2 Dead+1.6 Wind 90 deg - No Ice
11	0.9 Dead+1.6 Wind 90 deg - No Ice
12	1.2 Dead+1.6 Wind 120 deg - No Ice
13	0.9 Dead+1.6 Wind 120 deg - No Ice
14	1.2 Dead+1.6 Wind 135 deg - No Ice
15	0.9 Dead+1.6 Wind 135 deg - No Ice
16	1.2 Dead+1.6 Wind 150 deg - No Ice
17	0.9 Dead+1.6 Wind 150 deg - No Ice
18	1.2 Dead+1.6 Wind 180 deg - No Ice
19	0.9 Dead+1.6 Wind 180 deg - No Ice
20	1.2 Dead+1.6 Wind 210 deg - No Ice
21	0.9 Dead+1.6 Wind 210 deg - No Ice
22	1.2 Dead+1.6 Wind 225 deg - No Ice
23	0.9 Dead+1.6 Wind 225 deg - No Ice
24	1.2 Dead+1.6 Wind 240 deg - No Ice
25	0.9 Dead+1.6 Wind 240 deg - No Ice
26	1.2 Dead+1.6 Wind 270 deg - No Ice
27	0.9 Dead+1.6 Wind 270 deg - No Ice
28	1.2 Dead+1.6 Wind 300 deg - No Ice
29	0.9 Dead+1.6 Wind 300 deg - No Ice
30	1.2 Dead+1.6 Wind 315 deg - No Ice
31	0.9 Dead+1.6 Wind 315 deg - No Ice
32	1.2 Dead+1.6 Wind 330 deg - No Ice
33	0.9 Dead+1.6 Wind 330 deg - No Ice
34	1.2 Dead+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 45 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
39	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
40	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
41	1.2 Dead+1.0 Wind 135 deg+1.0 Ice+1.0 Temp
42	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
43	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
44	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
45	1.2 Dead+1.0 Wind 225 deg+1.0 Ice+1.0 Temp
46	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
47	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
48	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
49	1.2 Dead+1.0 Wind 315 deg+1.0 Ice+1.0 Temp
50	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
51	Dead+Wind 0 deg - Service
52	Dead+Wind 30 deg - Service
53	Dead+Wind 45 deg - Service
54	Dead+Wind 60 deg - Service
55	Dead+Wind 90 deg - Service
56	Dead+Wind 120 deg - Service
57	Dead+Wind 135 deg - Service
58	Dead+Wind 150 deg - Service
59	Dead+Wind 180 deg - Service
60	Dead+Wind 210 deg - Service
61	Dead+Wind 225 deg - Service
62	Dead+Wind 240 deg - Service
63	Dead+Wind 270 deg - Service
64	Dead+Wind 300 deg - Service
65	Dead+Wind 315 deg - Service

Comb. No.	Description
66	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
T1	195 - 175	Leg	Max Tension	19	18435.55	-292.64	1.80
			Max. Compression	24	-24494.99	661.51	-29.67
			Max. Mx	8	10253.50	1187.84	1.47
			Max. My	32	-3075.92	-3.13	-1174.11
			Max. Vy	8	1522.25	-225.06	-109.16
			Max. Vx	12	2285.11	-117.08	-213.85
		Diagonal	Max Tension	10	5419.63	0.00	0.00
			Max. Compression	10	-5492.64	0.00	0.00
			Max. Mx	45	847.41	-15.40	0.93
			Max. My	26	-3590.89	-4.90	-4.60
			Max. Vy	44	-21.89	-15.31	-1.44
			Max. Vx	26	1.51	-4.90	-4.60
		Top Girt	Max Tension	19	341.81	0.00	0.00
			Max. Compression	12	-362.83	0.00	0.00
			Max. Mx	34	-35.20	36.29	0.00
			Max. My	14	67.36	0.00	-0.00
			Max. Vy	34	-29.03	0.00	0.00
			Max. Vx	14	0.00	0.00	0.00
		Bottom Girt	Max Tension	3	209.94	0.00	0.00
			Max. Compression	28	-230.89	0.00	0.00
			Max. Mx	34	-46.93	52.26	0.00
			Max. My	16	-11.39	0.00	-0.00
			Max. Vy	34	-34.84	0.00	0.00
			Max. Vx	16	0.00	0.00	0.00
T2	175 - 155	Leg	Max Tension	19	59054.34	-221.88	-40.27
			Max. Compression	24	-70270.08	272.35	-2.19
			Max. Mx	8	24096.32	2074.23	-7.51
			Max. My	32	-6328.87	-54.58	-2052.65
			Max. Vy	8	-949.22	-689.97	33.71
			Max. Vx	32	933.48	-14.95	621.97
		Diagonal	Max Tension	10	8300.11	0.00	0.00
			Max. Compression	10	-8271.70	0.00	0.00
			Max. Mx	43	1345.41	40.43	-6.34
			Max. My	26	-7683.06	2.16	18.83
			Max. Vy	43	37.84	40.43	-6.34
			Max. Vx	26	-4.55	0.00	0.00
T3	155 - 135	Leg	Max Tension	19	103879.45	-855.10	-26.77
			Max. Compression	24	-121189.73	0.73	-61.26
			Max. Mx	28	84677.43	1690.59	-41.70
			Max. My	10	-7493.25	-43.90	-1719.18
			Max. Vy	18	-1180.58	-1013.31	-18.82
			Max. Vx	26	-1149.95	-33.32	-890.60
		Diagonal	Max Tension	10	9493.91	0.00	0.00
			Max. Compression	10	-9553.90	0.00	0.00
			Max. Mx	43	1841.50	67.09	-9.64
			Max. My	28	-7615.00	11.99	12.39
			Max. Vy	43	54.00	67.09	-9.64
			Max. Vx	50	-3.29	0.00	0.00
T4	135 - 115	Leg	Max Tension	19	149358.83	-181.63	-29.08
			Max. Compression	24	-171375.71	393.89	-77.97
			Max. Mx	13	-167662.94	396.52	28.12
			Max. My	26	-10676.76	-5.30	-394.87

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. Vy	18	120.10	-308.77	-31.57
			Max. Vx	24	160.57	-166.08	-275.46
		Diagonal	Max Tension	4	9091.30	0.00	0.00
			Max. Compression	4	-9199.32	0.00	0.00
			Max. Mx	48	1942.85	97.43	12.96
			Max. My	35	-68.64	84.17	14.36
			Max. Vy	48	69.18	97.43	12.96
			Max. Vx	35	-3.94	0.00	0.00
T5	115 - 95	Leg	Max Tension	19	190133.95	-262.97	-33.36
			Max. Compression	24	-217758.68	241.74	-68.61
			Max. Mx	13	-182908.35	396.52	28.12
			Max. My	26	-11035.90	-5.31	-394.87
			Max. Vy	18	-96.99	-380.66	-48.16
			Max. Vx	24	-145.33	-201.78	-374.60
		Diagonal	Max Tension	4	9883.32	0.00	0.00
			Max. Compression	4	-10026.69	0.00	0.00
			Max. Mx	48	2141.46	145.85	-17.80
			Max. My	35	-397.36	140.80	19.91
			Max. Vy	48	91.58	145.85	-17.80
			Max. Vx	35	-4.92	0.00	0.00
T6	95 - 75	Leg	Max Tension	29	228408.18	-293.78	-25.22
			Max. Compression	24	-262474.36	237.39	-55.31
			Max. Mx	18	224930.00	-300.90	-43.11
			Max. My	26	-15077.89	-13.70	-370.73
			Max. Vy	18	-99.15	-300.90	-43.11
			Max. Vx	24	-155.19	-165.42	-352.83
		Diagonal	Max Tension	4	10912.96	0.00	0.00
			Max. Compression	4	-11002.63	0.00	0.00
			Max. Mx	48	2219.26	193.12	-23.61
			Max. My	45	721.52	173.76	-26.32
			Max. Vy	48	109.52	193.12	-23.61
			Max. Vx	46	5.78	0.00	0.00
T7	75 - 55	Leg	Max Tension	29	265742.24	-351.27	-34.42
			Max. Compression	24	-306520.64	76.91	4.34
			Max. Mx	18	261269.43	-366.33	-36.33
			Max. My	26	-17942.42	-42.37	-472.65
			Max. Vy	18	-121.61	-366.33	-36.33
			Max. Vx	24	-178.04	-215.02	-433.90
		Diagonal	Max Tension	4	12049.51	0.00	0.00
			Max. Compression	4	-12181.75	0.00	0.00
			Max. Mx	48	2214.53	246.03	-30.00
			Max. My	45	714.37	224.06	-33.24
			Max. Vy	48	125.30	246.03	28.70
			Max. Vx	45	6.54	0.00	0.00
T8	55 - 40	Leg	Max Tension	29	294784.68	-128.48	-5.85
			Max. Compression	24	-341655.84	772.53	-137.60
			Max. Mx	13	-335116.10	779.81	50.57
			Max. My	26	-21306.67	-13.64	-703.35
			Max. Vy	43	252.35	-769.29	-38.19
			Max. Vx	10	-186.72	-14.02	703.19
		Diagonal	Max Tension	4	12628.59	0.00	0.00
			Max. Compression	4	-12755.50	0.00	0.00
			Max. Mx	48	2010.79	257.66	-30.78
			Max. My	37	-3000.63	228.61	35.08
			Max. Vy	48	130.20	249.69	-31.33
			Max. Vx	38	6.63	0.00	0.00
T9	40 - 20	Leg	Max Tension	29	329487.74	-339.00	-24.95
			Max. Compression	2	-384250.84	400.32	43.90
			Max. Mx	40	-148680.40	2057.27	11.16
			Max. My	26	-21738.11	-13.65	-703.35
			Max. Vy	43	-501.04	-1303.73	-13.79

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. Vx	26	172.79	-33.39	-671.94
		Diagonal	Max Tension	4	13942.16	0.00	0.00
			Max. Compression	4	-14159.03	0.00	0.00
			Max. Mx	48	1188.48	397.69	-44.90
			Max. My	37	-5897.83	376.19	48.68
			Max. Vy	48	157.60	397.69	-44.90
			Max. Vx	37	-8.03	0.00	0.00
T10	20 - 0	Leg	Max Tension	29	364266.19	-341.99	-27.93
			Max. Compression	2	-428396.77	-0.00	-0.07
			Max. Mx	40	-159645.34	3341.70	4.12
			Max. My	26	-26887.82	-57.56	-785.89
			Max. Vy	43	-961.97	-3055.06	-8.50
			Max. Vx	26	-211.02	-57.57	-785.89
		Diagonal	Max Tension	20	14910.48	0.00	0.00
			Max. Compression	20	-15194.46	0.00	0.00
			Max. Mx	48	-531.53	533.87	-55.84
			Max. My	37	-7799.28	511.44	60.39
			Max. Vy	48	176.30	533.87	-55.84
			Max. Vx	37	-9.05	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Leg C	Max. Vert	24	434718.65	39137.17	-24450.67
	Max. H_x	24	434718.65	39137.17	-24450.67
	Max. H_z	7	-356793.95	-32069.91	22236.13
	Min. Vert	9	-368008.84	-33789.14	21436.62
	Min. H_x	9	-368008.84	-33789.14	21436.62
	Min. H_z	24	434718.65	39137.17	-24450.67
Leg B	Max. Vert	12	433411.53	-39631.71	-23578.84
	Max. H_x	29	-369316.49	34334.79	20558.50
	Max. H_z	31	-358124.82	32824.30	20979.71
	Min. Vert	29	-369316.49	34334.79	20558.50
	Min. H_x	12	433411.53	-39631.71	-23578.84
	Min. H_z	12	433411.53	-39631.71	-23578.84
Leg A	Max. Vert	2	434989.27	-1002.34	46136.21
	Max. H_x	27	21325.23	7180.51	1616.23
	Max. H_z	2	434989.27	-1002.34	46136.21
	Min. Vert	19	-368132.60	1033.37	-39995.51
	Min. H_x	11	21109.16	-7200.79	1598.22
	Min. H_z	19	-368132.60	1033.37	-39995.51

Tower Mast Reaction Summary

Load Combination	Vertical lb	$Shear_x$ lb	$Shear_z$ lb	Overturning Moment, M_x lb-ft	Overturning Moment, M_z lb-ft	Torque lb-ft
Dead Only	69330.68	0.00	0.00	-9412.29	14586.27	-0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	83196.81	-15.05	-75610.94	-8288330.40	19857.70	-41443.54
0.9 Dead+1.6 Wind 0 deg - No	62397.61	-15.05	-75610.94	-8277295.28	15452.08	-41425.43

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	lb-ft	lb-ft	lb-ft
Ice						
1.2 Dead+1.6 Wind 30 deg - No Ice	83196.81	35993.59	-62372.83	-6954101.28	-3988230.93	-62408.48
0.9 Dead+1.6 Wind 30 deg - No Ice	62397.61	35993.59	-62372.83	-6944345.18	-3988624.31	-62395.56
1.2 Dead+1.6 Wind 45 deg - No Ice	83196.81	50488.47	-50500.76	-5648924.05	-5618161.33	-66801.61
0.9 Dead+1.6 Wind 45 deg - No Ice	62397.61	50488.47	-50500.76	-5640462.82	-5616916.33	-66796.00
1.2 Dead+1.6 Wind 60 deg - No Ice	83196.81	61324.23	-35405.56	-3975336.73	-6848234.07	-66651.19
0.9 Dead+1.6 Wind 60 deg - No Ice	62397.61	61324.23	-35405.56	-3968546.14	-6845747.75	-66647.18
1.2 Dead+1.6 Wind 90 deg - No Ice	83196.81	72013.25	15.05	-9126.23	-7998016.93	-53052.62
0.9 Dead+1.6 Wind 90 deg - No Ice	62397.61	72013.25	15.05	-6308.12	-7994397.66	-53026.72
1.2 Dead+1.6 Wind 120 deg - No Ice	83196.81	65473.47	37818.51	4129159.06	-7149491.53	-25226.03
0.9 Dead+1.6 Wind 120 deg - No Ice	62397.61	65473.47	37818.51	4127861.99	-7146771.44	-25238.46
1.2 Dead+1.6 Wind 135 deg - No Ice	83195.92	52198.30	52209.17	5751511.11	-5743405.62	-8228.70
0.9 Dead+1.6 Wind 135 deg - No Ice	62397.61	52197.53	52209.83	5748581.15	-5742065.19	-8240.84
1.2 Dead+1.6 Wind 150 deg - No Ice	83196.81	36019.66	62387.89	6933739.96	-3992097.78	9362.96
0.9 Dead+1.6 Wind 150 deg - No Ice	62398.31	36018.83	62388.62	6929601.97	-3992489.97	9333.40
1.2 Dead+1.6 Wind 180 deg - No Ice	83196.81	15.05	70837.20	7920524.21	15431.83	41430.56
0.9 Dead+1.6 Wind 180 deg - No Ice	62397.61	15.05	70837.20	7915383.33	11033.15	41413.83
1.2 Dead+1.6 Wind 210 deg - No Ice	83196.81	-35993.59	62372.83	6931467.35	4023512.39	62408.45
0.9 Dead+1.6 Wind 210 deg - No Ice	62397.61	-35993.59	62372.83	6927336.28	4015105.65	62395.56
1.2 Dead+1.6 Wind 225 deg - No Ice	83196.81	-50488.47	50500.76	5626240.75	5653418.21	66818.89
0.9 Dead+1.6 Wind 225 deg - No Ice	62398.54	-50487.76	50501.50	5623406.09	5643372.02	66811.13
1.2 Dead+1.6 Wind 240 deg - No Ice	83196.81	-65458.41	37792.43	4125280.21	7182448.25	66670.18
0.9 Dead+1.6 Wind 240 deg - No Ice	62397.61	-65458.41	37792.43	4123982.41	7170927.52	66663.99
1.2 Dead+1.6 Wind 270 deg - No Ice	83196.81	-72013.25	-15.06	-13524.26	8033144.88	53052.49
0.9 Dead+1.6 Wind 270 deg - No Ice	62397.61	-72013.25	-15.06	-10705.57	8020720.62	53026.70
1.2 Dead+1.6 Wind 300 deg - No Ice	83196.81	-61339.29	-35431.64	-3979076.74	6885613.38	25220.49
0.9 Dead+1.6 Wind 300 deg - No Ice	62397.61	-61339.29	-35431.64	-3972285.37	6874318.78	25233.26
1.2 Dead+1.6 Wind 315 deg - No Ice	83196.81	-50509.76	-50522.05	-5651954.54	5656497.11	8209.27
0.9 Dead+1.6 Wind 315 deg - No Ice	62397.61	-50509.76	-50522.05	-5643492.52	5646442.55	8227.47
1.2 Dead+1.6 Wind 330 deg - No Ice	83196.81	-36019.67	-62387.88	-6956235.67	4027311.94	-9363.23
0.9 Dead+1.6 Wind 330 deg - No Ice	62398.31	-36020.71	-62387.53	-6946475.90	4018888.67	-9333.63

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	lb-ft	lb-ft	lb-ft
1.2 Dead+1.0 Ice+1.0 Temp	179498.19	0.00	0.00	-116940.01	87201.76	-1.54
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	179498.19	-2.54	-21579.42	-2486172.29	87893.67	-19141.03
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	179498.19	10549.94	-18278.11	-2139380.47	-1079528.38	-27090.77
1.2 Dead+1.0 Wind 45 deg+1.0 Ice+1.0 Temp	179498.19	14865.54	-14867.61	-1764249.34	-1559139.41	-28405.41
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	179498.19	18139.26	-10472.71	-1278932.41	-1924484.46	-27782.48
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	179498.19	21104.28	2.54	-116947.06	-2247180.90	-21031.12
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	179498.19	18687.05	10791.91	1067442.00	-1963834.24	-8645.67
1.2 Dead+1.0 Wind 135 deg+1.0 Ice+1.0 Temp	179498.19	15091.73	15093.80	1546036.69	-1575530.41	-1339.33
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	179498.19	10554.34	18280.65	1905145.77	-1080141.89	6059.43
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	179498.19	2.54	20949.81	2206575.80	87153.19	19137.41
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	179498.19	-10549.94	18278.11	1904780.34	1254538.02	27090.94
1.2 Dead+1.0 Wind 225 deg+1.0 Ice+1.0 Temp	179498.19	-14865.54	14867.61	1529640.35	1734147.49	28403.79
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	179498.19	-18684.51	10787.51	1066785.15	2138492.29	27786.28
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	179498.19	-21104.28	-2.54	-117656.95	2422169.57	21030.95
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	179498.19	-18141.80	-10477.10	-1279537.72	2099829.94	8643.23
1.2 Dead+1.0 Wind 315 deg+1.0 Ice+1.0 Temp	179498.19	-14869.13	-14871.20	-1764738.47	1734638.33	1338.56
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	179498.19	-10554.34	-18280.65	-2139726.16	1255141.50	-6059.42
Dead+Wind 0 deg - Service	69330.68	-3.32	-16788.76	-1843626.20	15119.53	-9137.61
Dead+Wind 30 deg - Service	69330.68	7994.74	-13853.94	-1548207.61	-873237.52	-13760.01
Dead+Wind 45 deg - Service	69330.68	11214.92	-11217.63	-1258959.01	-1234531.44	-14732.26
Dead+Wind 60 deg - Service	69330.68	13622.65	-7865.04	-888036.50	-1507214.36	-14700.97
Dead+Wind 90 deg - Service	69330.68	15995.23	3.32	-8919.66	-1761956.25	-11701.43
Dead+Wind 120 deg - Service	69330.68	14537.84	8397.26	908137.98	-1573620.65	-5565.18
Dead+Wind 135 deg - Service	69330.68	11591.89	11594.60	1267761.22	-1262130.67	-1808.05
Dead+Wind 150 deg - Service	69330.68	8000.49	13857.26	1529900.77	-874079.80	2062.69
Dead+Wind 180 deg - Service	69330.68	3.32	15735.84	1748718.03	14144.36	9136.41
Dead+Wind 210 deg - Service	69330.68	-7994.74	13853.94	1529409.58	902502.78	13760.02
Dead+Wind 225 deg - Service	69330.68	-11214.92	11217.63	1240158.33	1263793.78	14734.24
Dead+Wind 240 deg - Service	69330.68	-14534.52	8391.51	907294.94	1602392.32	14702.90
Dead+Wind 270 deg - Service	69330.68	-15995.23	-3.32	-9889.70	1791213.44	11701.40
Dead+Wind 300 deg - Service	69330.68	-13625.97	-7870.79	-888874.09	1536960.16	5565.00
Dead+Wind 315 deg - Service	69330.68	-11219.62	-11222.33	-1259641.45	1264480.75	1812.46
Dead+Wind 330 deg - Service	69330.68	-8000.49	-13857.26	-1548687.20	903349.03	-2062.68

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	lb	lb	lb	lb	lb	lb	
1	0.00	-69330.68	0.00	-0.00	69330.68	-0.00	0.000%
2	-15.05	-83196.81	-75610.94	15.05	83196.81	75610.94	0.000%
3	-15.05	-62397.61	-75610.94	15.05	62397.61	75610.94	0.000%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	% Error
4	35993.59	-83196.81	-62372.83	-35993.59	83196.81	62372.83	0.000%
5	35993.59	-62397.61	-62372.83	-35993.59	62397.61	62372.83	0.000%
6	50488.47	-83196.81	-50500.76	-50488.47	83196.81	50500.76	0.000%
7	50488.47	-62397.61	-50500.76	-50488.47	62397.61	50500.76	0.000%
8	61324.23	-83196.81	-35405.56	-61324.23	83196.81	35405.56	0.000%
9	61324.23	-62397.61	-35405.56	-61324.23	62397.61	35405.56	0.000%
10	72013.25	-83196.81	15.05	-72013.25	83196.81	-15.05	0.000%
11	72013.25	-62397.61	15.05	-72013.25	62397.61	-15.05	0.000%
12	65473.46	-83196.81	37818.51	-65473.47	83196.81	-37818.51	0.000%
13	65473.46	-62397.61	37818.51	-65473.47	62397.61	-37818.51	0.000%
14	52197.53	-83196.81	52209.82	-52198.30	83195.92	-52209.17	0.001%
15	52197.53	-62397.61	52209.82	-52197.53	62397.61	-52209.83	0.000%
16	36019.66	-83196.81	62387.88	-36019.66	83196.81	-62387.89	0.000%
17	36019.66	-62397.61	62387.88	-36018.83	62398.31	-62388.62	0.001%
18	15.05	-83196.81	70837.19	-15.05	83196.81	-70837.20	0.000%
19	15.05	-62397.61	70837.19	-15.05	62397.61	-70837.20	0.000%
20	-35993.59	-83196.81	62372.83	35993.59	83196.81	-62372.83	0.000%
21	-35993.59	-62397.61	62372.83	35993.59	62397.61	-62372.83	0.000%
22	-50488.47	-83196.81	50500.76	50488.47	83196.81	-50500.76	0.000%
23	-50488.47	-62397.61	50500.76	50487.76	62398.54	-50501.50	0.001%
24	-65458.41	-83196.81	37792.43	65458.41	83196.81	-37792.43	0.000%
25	-65458.41	-62397.61	37792.43	65458.41	62397.61	-37792.43	0.000%
26	-72013.25	-83196.81	-15.05	72013.25	83196.81	15.06	0.000%
27	-72013.25	-62397.61	-15.05	72013.25	62397.61	15.06	0.000%
28	-61339.28	-83196.81	-35431.63	61339.29	83196.81	35431.64	0.000%
29	-61339.28	-62397.61	-35431.63	61339.29	62397.61	35431.64	0.000%
30	-50509.76	-83196.81	-50522.05	50509.76	83196.81	50522.05	0.000%
31	-50509.76	-62397.61	-50522.05	50509.76	62397.61	50522.05	0.000%
32	-36019.66	-83196.81	-62387.88	36019.67	83196.81	62387.88	0.000%
33	-36019.66	-62397.61	-62387.88	36020.71	62398.31	62387.53	0.001%
34	0.00	-179498.19	0.00	-0.00	179498.19	-0.00	0.000%
35	-2.54	-179498.19	-21579.42	2.54	179498.19	21579.42	0.000%
36	10549.95	-179498.19	-18278.12	-10549.94	179498.19	18278.11	0.000%
37	14865.54	-179498.19	-14867.61	-14865.54	179498.19	14867.61	0.000%
38	18139.27	-179498.19	-10472.71	-18139.26	179498.19	10472.71	0.000%
39	21104.29	-179498.19	2.54	-21104.28	179498.19	-2.54	0.000%
40	18687.06	-179498.19	10791.91	-18687.05	179498.19	-10791.91	0.000%
41	15091.73	-179498.19	15093.80	-15091.73	179498.19	-15093.80	0.000%
42	10554.34	-179498.19	18280.66	-10554.34	179498.19	-18280.65	0.000%
43	2.54	-179498.19	20949.82	-2.54	179498.19	-20949.81	0.000%
44	-10549.95	-179498.19	18278.12	10549.94	179498.19	-18278.11	0.000%
45	-14865.54	-179498.19	14867.61	14865.54	179498.19	-14867.61	0.000%
46	-18684.52	-179498.19	10787.51	18684.51	179498.19	-10787.51	0.000%
47	-21104.29	-179498.19	-2.54	21104.28	179498.19	2.54	0.000%
48	-18141.81	-179498.19	-10477.11	18141.80	179498.19	10477.10	0.000%
49	-14869.13	-179498.19	-14871.20	14869.13	179498.19	14871.20	0.000%
50	-10554.34	-179498.19	-18280.66	10554.34	179498.19	18280.65	0.000%
51	-3.32	-69330.68	-16788.76	3.32	69330.68	16788.76	0.000%
52	7994.74	-69330.68	-13853.94	-7994.74	69330.68	13853.94	0.000%
53	11214.92	-69330.68	-11217.63	-11214.92	69330.68	11217.63	0.000%
54	13622.65	-69330.68	-7865.04	-13622.65	69330.68	7865.04	0.000%
55	15995.23	-69330.68	3.32	-15995.23	69330.68	-3.32	0.000%
56	14537.84	-69330.68	8397.26	-14537.84	69330.68	-8397.26	0.000%
57	11591.89	-69330.68	11594.60	-11591.89	69330.68	-11594.60	0.000%
58	8000.49	-69330.68	13857.26	-8000.49	69330.68	-13857.26	0.000%
59	3.32	-69330.68	15735.84	-3.32	69330.68	-15735.84	0.000%
60	-7994.74	-69330.68	13853.94	7994.74	69330.68	-13853.94	0.000%
61	-11214.92	-69330.68	11217.63	11214.92	69330.68	-11217.63	0.000%
62	-14534.52	-69330.68	8391.51	14534.52	69330.68	-8391.51	0.000%
63	-15995.23	-69330.68	-3.32	15995.23	69330.68	3.32	0.000%
64	-13625.97	-69330.68	-7870.79	13625.97	69330.68	7870.79	0.000%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	% Error
65	-11219.62	-69330.68	-11222.33	11219.62	69330.68	11222.33	0.000%
66	-8000.49	-69330.68	-13857.26	8000.49	69330.68	13857.26	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00000001
3	Yes	4	0.00000001	0.00000001
4	Yes	4	0.00000001	0.00000055
5	Yes	4	0.00000001	0.00000053
6	Yes	4	0.00000001	0.00000058
7	Yes	4	0.00000001	0.00000053
8	Yes	4	0.00000001	0.00000056
9	Yes	4	0.00000001	0.00000051
10	Yes	4	0.00000001	0.00000054
11	Yes	4	0.00000001	0.00000051
12	Yes	4	0.00000001	0.00000001
13	Yes	4	0.00000001	0.00000001
14	Yes	4	0.00000001	0.00000126
15	Yes	4	0.00000001	0.00000001
16	Yes	4	0.00000001	0.00000052
17	Yes	4	0.00000001	0.00000115
18	Yes	4	0.00000001	0.00000055
19	Yes	4	0.00000001	0.00000048
20	Yes	4	0.00000001	0.00000055
21	Yes	4	0.00000001	0.00000053
22	Yes	4	0.00000001	0.00000001
23	Yes	4	0.00000001	0.00000138
24	Yes	4	0.00000001	0.00000001
25	Yes	4	0.00000001	0.00000001
26	Yes	4	0.00000001	0.00000054
27	Yes	4	0.00000001	0.00000051
28	Yes	4	0.00000001	0.00000052
29	Yes	4	0.00000001	0.00000046
30	Yes	4	0.00000001	0.00000054
31	Yes	4	0.00000001	0.00000048
32	Yes	4	0.00000001	0.00000053
33	Yes	4	0.00000001	0.00000115
34	Yes	4	0.00000001	0.00000001
35	Yes	4	0.00000001	0.00000145
36	Yes	4	0.00000001	0.00000150
37	Yes	4	0.00000001	0.00000153
38	Yes	4	0.00000001	0.00000154
39	Yes	4	0.00000001	0.00000150
40	Yes	4	0.00000001	0.00000142
41	Yes	4	0.00000001	0.00000145
42	Yes	4	0.00000001	0.00000148
43	Yes	4	0.00000001	0.00000153
44	Yes	4	0.00000001	0.00000150
45	Yes	4	0.00000001	0.00000148
46	Yes	4	0.00000001	0.00000146
47	Yes	4	0.00000001	0.00000154
48	Yes	4	0.00000001	0.00000157
49	Yes	4	0.00000001	0.00000156

50	Yes	4	0.00000001	0.00000153
51	Yes	4	0.00000001	0.00000001
52	Yes	4	0.00000001	0.00000001
53	Yes	4	0.00000001	0.00000001
54	Yes	4	0.00000001	0.00000001
55	Yes	4	0.00000001	0.00000001
56	Yes	4	0.00000001	0.00000001
57	Yes	4	0.00000001	0.00000001
58	Yes	4	0.00000001	0.00000001
59	Yes	4	0.00000001	0.00000001
60	Yes	4	0.00000001	0.00000001
61	Yes	4	0.00000001	0.00000001
62	Yes	4	0.00000001	0.00000001
63	Yes	4	0.00000001	0.00000001
64	Yes	4	0.00000001	0.00000001
65	Yes	4	0.00000001	0.00000001
66	Yes	4	0.00000001	0.00000001

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	195 - 175	2.871	62	0.1158	0.0293
T2	175 - 155	2.385	62	0.1116	0.0212
T3	155 - 135	1.905	62	0.1036	0.0164
T4	135 - 115	1.475	62	0.0917	0.0168
T5	115 - 95	1.093	62	0.0786	0.0158
T6	95 - 75	0.775	62	0.0636	0.0144
T7	75 - 55	0.515	62	0.0494	0.0122
T8	55 - 40	0.305	51	0.0364	0.0092
T9	40 - 20	0.174	51	0.0265	0.0060
T10	20 - 0	0.058	51	0.0127	0.0028

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
192.00	Top Triangular Mount	62	2.798	0.1153	0.0281	664353
180.00	SitePro VFA12-HD	62	2.507	0.1129	0.0232	221449
172.00	Pirod 12' T-Frame Sector Mount (1)	62	2.311	0.1107	0.0198	323509
160.00	Pirod 12' T-Frame Sector Mount (1)	62	2.022	0.1060	0.0171	97491
146.00	Pirod 12' T-Frame Sector Mount (1)	62	1.705	0.0986	0.0171	89818
80.00	GPS	62	0.575	0.0528	0.0128	87321

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	195 - 175	12.868	24	0.5117	0.1331
T2	175 - 155	10.709	24	0.4973	0.0962
T3	155 - 135	8.563	24	0.4639	0.0745
T4	135 - 115	6.631	24	0.4115	0.0764
T5	115 - 95	4.915	24	0.3530	0.0719
T6	95 - 75	3.487	24	0.2856	0.0654
T7	75 - 55	2.318	2	0.2221	0.0554
T8	55 - 40	1.375	2	0.1635	0.0417
T9	40 - 20	0.783	2	0.1191	0.0271
T10	20 - 0	0.262	2	0.0571	0.0129

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
192.00	Top Triangular Mount	24	12.546	0.5101	0.1277	238347
180.00	SitePro VFA12-HD	24	11.252	0.5022	0.1053	79449
172.00	Pirod 12' T-Frame Sector Mount (1)	24	10.382	0.4938	0.0900	174676
160.00	Pirod 12' T-Frame Sector Mount (1)	24	9.086	0.4744	0.0775	23081
146.00	Pirod 12' T-Frame Sector Mount (1)	24	7.665	0.4418	0.0775	20305
80.00	GPS	2	2.587	0.2374	0.0582	19449

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load per Bolt lb	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	195	Leg	A325N	1.1250	4	4608.89	67096.30	0.069 ✔	1	Bolt Tension
T2	175	Leg	A325N	1.1250	6	9842.39	67096.30	0.147 ✔	1	Bolt Tension
		Diagonal	A325N	0.8750	1	8300.11	11092.50	0.748 ✔	1	Member Bearing
T3	155	Leg	A325N	1.1250	6	17313.20	67096.30	0.258 ✔	1	Bolt Tension
		Diagonal	A325N	0.8750	1	9493.91	18487.50	0.514 ✔	1	Member Bearing
T4	135	Leg	A325N	1.1250	6	24893.10	67096.30	0.371 ✔	1	Bolt Tension
		Diagonal	A325N	0.8750	1	9091.30	14790.00	0.615 ✔	1	Member Bearing
T5	115	Leg	A325N	1.1250	8	23766.70	67096.30	0.354 ✔	1	Bolt Tension
		Diagonal	A325N	1.0000	1	9883.32	25447.50	0.388 ✔	1	Member Bearing
T6	95	Leg	A325N	1.1250	8	28551.00	67096.30	0.426 ✔	1	Bolt Tension
		Diagonal	A325N	1.0000	1	10913.00	21206.30	0.515 ✔	1	Member Bearing
T7	75	Leg	A325N	1.2500	8	33217.80	82835.00	0.401 ✔	1	Bolt Tension
		Diagonal	A325N	1.0000	1	12049.50	16965.00	0.710 ✔	1	Member Bearing
T8	55	Leg	A325N	1.2500	8	36848.10	82835.00	0.445 ✔	1	Bolt Tension
		Diagonal	A325N	1.0000	1	12628.60	16965.00	0.744 ✔	1	Member Bearing
T9	40	Leg	A325N	1.2500	8	41186.00	82835.00	0.497 ✔	1	Bolt Tension

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load per Bolt lb	Ratio Load / Allowable	Allowable Ratio	Criteria
T10	20	Diagonal	A325N	1.0000	1	13942.20	21206.30	0.657 ✔	1	Member Bearing
		Leg	A449	1.3750	8	45533.30	87701.50	0.519 ✔	1	Bolt Tension
		Diagonal	A325N	1.0000	1	14910.50	25447.50	0.586 ✔	1	Member Bearing

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	195 - 175	3	20.01	3.33	53.4 K=1.00	7.0686	-24495.00	258313.00	0.095 [1] ✔
T2	175 - 155	3 3/4	20.03	6.68	85.5 K=1.00	11.0447	-70270.10	291317.00	0.241 [1] ✔
T3	155 - 135	4	20.03	6.68	80.1 K=1.00	12.5664	-121190.00	353604.00	0.343 [1] ✔
T4	135 - 115	4 1/4	20.03	6.68	75.4 K=1.00	14.1863	-171376.00	421170.00	0.407 [1] ✔
T5	115 - 95	4 1/4	20.03	6.68	75.4 K=1.00	14.1863	-217759.00	421170.00	0.517 [1] ✔
T6	95 - 75	4 1/2	20.03	6.68	71.2 K=1.00	15.9043	-262474.00	493875.00	0.531 [1] ✔
T7	75 - 55	4 3/4	20.03	6.68	67.5 K=1.00	17.7205	-306521.00	571599.00	0.536 [1] ✔
T8	55 - 40	4 3/4	15.03	5.01	50.6 K=1.00	17.7205	-341656.00	661231.00	0.517 [1] ✔
T9	40 - 20	4 3/4	20.03	6.68	67.5 K=1.00	17.7205	-384251.00	571599.00	0.672 [1] ✔
T10	20 - 0	5	20.03	6.68	64.1 K=1.00	19.6350	-428397.00	654248.00	0.655 [1] ✔

[1] P_u / ϕP_n controls

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	195 - 175	1 1/4	6.79	3.30	114.0 K=0.90	1.2272	-5492.65	20048.60	0.274 [1] ✔
T2	175 - 155	L2 1/2x2 1/2x3/16	10.16	4.94	119.9	0.9020	-8221.33	13713.70	0.599 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T3	155 - 135	L2 1/2x2 1/2x5/16	11.74	5.72	140.4 K=1.00	1.4600	-9553.90	16733.60	0.571 [1] ✔
T4	135 - 115	L3x3x1/4	13.44	6.56	132.9 K=1.00	1.4400	-9199.32	18412.40	0.500 [1] ✔
T5	115 - 95	L3x3x3/8	15.21	7.43	151.8 K=1.00	2.1100	-10026.70	20687.10	0.485 [1] ✔
T6	95 - 75	L3 1/2x3 1/2x5/16	17.03	8.32	144.8 K=1.00	2.0900	-11002.60	22528.10	0.488 [1] ✔
T7	75 - 55	L4x4x1/4	18.88	9.24	139.5 K=1.00	1.9400	-12181.70	22521.80	0.541 [1] ✔
T8	55 - 40	L4x4x1/4	19.89	9.70	146.5 K=1.00	1.9400	-12755.50	20433.10	0.624 [1] ✔
T9	40 - 20	L4x4x5/16	22.19	10.90	165.3 K=1.00	2.4000	-14159.00	19839.90	0.714 [1] ✔
T10	20 - 0	L4x4x3/8	24.11	11.84	180.4 K=1.00	2.8600	-15194.50	19861.70	0.765 [1] ✔

[1] P_u / ϕP_n controls

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	195 - 175	1 1/4	5.00	4.75	127.7 K=0.70	1.2272	-362.83	16855.20	0.022 [1] ✔

[1] P_u / ϕP_n controls

Bottom Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	195 - 175	1 1/4	6.00	5.75	154.6 K=0.70	1.2272	-1218.63	11605.30	0.105 [1] ✔

[1] P_u / ϕP_n controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	195 - 175	3	20.01	3.33	53.4	7.0686	18435.50	318086.00	0.058 [1] ✔
T2	175 - 155	3 3/4	20.03	6.68	85.5	11.0447	59054.30	497010.00	0.119 [1] ✔
T3	155 - 135	4	20.03	6.68	80.1	12.5664	103879.00	565487.00	0.184 [1] ✔
T4	135 - 115	4 1/4	20.03	6.68	75.4	14.1863	149359.00	638381.00	0.234 [1] ✔
T5	115 - 95	4 1/4	20.03	6.68	75.4	14.1863	190134.00	638381.00	0.298 [1] ✔
T6	95 - 75	4 1/2	20.03	6.68	71.2	15.9043	228408.00	715694.00	0.319 [1] ✔
T7	75 - 55	4 3/4	20.03	6.68	67.5	17.7205	265742.00	797425.00	0.333 [1] ✔
T8	55 - 40	4 3/4	15.03	5.01	50.6	17.7205	294785.00	797425.00	0.370 [1] ✔
T9	40 - 20	4 3/4	20.03	6.68	67.5	17.7205	329488.00	797425.00	0.413 [1] ✔
T10	20 - 0	5	20.03	6.68	64.1	19.6350	364266.00	883573.00	0.412 [1] ✔

[1] $P_u / \phi P_n$ controls

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	195 - 175	1 1/4	6.79	3.30	126.7	1.2272	5419.63	39760.80	0.136 [1] ✔
T2	175 - 155	L2 1/2x2 1/2x3/16	9.67	4.71	74.9	0.9020	8300.11	29224.80	0.284 [1] ✔
T3	155 - 135	L2 1/2x2 1/2x5/16	11.74	5.72	92.6	1.4600	9493.91	47304.00	0.201 [1] ✔
T4	135 - 115	L3x3x1/4	13.44	6.56	86.5	1.4400	9091.30	46656.00	0.195 [1] ✔
T5	115 - 95	L3x3x3/8	15.21	7.43	99.8	2.1100	9883.32	68364.00	0.145 [1] ✔
T6	95 - 75	L3 1/2x3 1/2x5/16	17.03	8.32	94.3	2.0900	10913.00	67716.00	0.161 [1] ✔
T7	75 - 55	L4x4x1/4	18.88	9.24	90.3	1.9400	12049.50	62856.00	0.192 [1] ✔
T8	55 - 40	L4x4x1/4	19.89	9.70	94.7	1.9400	12628.60	62856.00	0.201 [1] ✔
T9	40 - 20	L4x4x5/16	22.19	10.90	107.1	2.4000	13942.20	77760.00	0.179 [1] ✔
T10	20 - 0	L4x4x3/8	24.11	11.84	117.2	2.8600	14910.50	92664.00	0.161 [1] ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
									✔

[1] P_u / ϕP_n controls

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	195 - 175	1 1/4	5.00	4.75	182.4	1.2272	341.81	39760.80	0.009 [1] ✔

[1] P_u / ϕP_n controls

Bottom Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	195 - 175	1 1/4	6.00	5.75	220.8	1.2272	1218.63	39760.80	0.031 [1] ✔

[1] P_u / ϕP_n controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
T1	195 - 175	Leg	3	1	-24495.00	258313.00	9.5	Pass
T2	175 - 155	Leg	3 3/4	46	-70270.10	291317.00	24.1	Pass
T3	155 - 135	Leg	4	67	-121190.00	353604.00	34.3	Pass
T4	135 - 115	Leg	4 1/4	88	-171376.00	421170.00	40.7	Pass
T5	115 - 95	Leg	4 1/4	109	-217759.00	421170.00	51.7	Pass
T6	95 - 75	Leg	4 1/2	130	-262474.00	493875.00	53.1	Pass
T7	75 - 55	Leg	4 3/4	151	-306521.00	571599.00	53.6	Pass
T8	55 - 40	Leg	4 3/4	172	-341656.00	661231.00	51.7	Pass
T9	40 - 20	Leg	4 3/4	195	-384251.00	571599.00	67.2	Pass
T10	20 - 0	Leg	5	216	-428397.00	654248.00	65.5	Pass
T1	195 - 175	Diagonal	1 1/4	11	-5492.65	20048.60	27.4	Pass
T2	175 - 155	Diagonal	L2 1/2x2 1/2x3/16	50	-8221.33	13713.70	59.9 74.8 (b)	Pass
T3	155 - 135	Diagonal	L2 1/2x2 1/2x5/16	71	-9553.90	16733.60	57.1	Pass
T4	135 - 115	Diagonal	L3x3x1/4	95	-9199.32	18412.40	50.0 61.5 (b)	Pass
T5	115 - 95	Diagonal	L3x3x3/8	116	-10026.70	20687.10	48.5	Pass
T6	95 - 75	Diagonal	L3 1/2x3 1/2x5/16	137	-11002.60	22528.10	48.8	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
							51.5 (b)	
T7	75 - 55	Diagonal	L4x4x1/4	158	-12181.70	22521.80	54.1	Pass
							71.0 (b)	
T8	55 - 40	Diagonal	L4x4x1/4	179	-12755.50	20433.10	62.4	Pass
							74.4 (b)	
T9	40 - 20	Diagonal	L4x4x5/16	200	-14159.00	19839.90	71.4	Pass
T10	20 - 0	Diagonal	L4x4x3/8	222	-15194.50	19861.70	76.5	Pass
T1	195 - 175	Top Girt	1 1/4	6	-362.83	16855.20	2.2	Pass
T1	195 - 175	Bottom Girt	1 1/4	9	-1218.63	11605.30	10.5	Pass
							Summary	
						Leg (T9)	67.2	Pass
						Diagonal (T10)	76.5	Pass
						Top Girt (T1)	2.2	Pass
						Bottom Girt (T1)	10.5	Pass
						Bolt Checks	74.8	Pass
						RATING =	**76.5**	**Pass**

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Subject:	FOUNDATION ANALYSIS
Location:	Northford, CT
Rev. 0: 8/30/21	Prepared by: T.J.L. Checked by: C.F.C. Job No. 21007.37

Pier and Mat Foundation Analysis:

Input Data:

Tower Data

Overturning Moment =	$OM := 8288 \cdot ft \cdot kips$	(User Input from tnxTower)	
Shear Force =	$S_t := 76 \cdot kip$	(User Input from tnxTower)	
Axial Force =	$WT_t := 83 \cdot kip$	(User Input from tnxTower)	
Max Compression Force =	$C_t := 435 \cdot kip$	(User Input from tnxTower)	
Max Uplift Force =	$U_t := 369 \cdot kip$	(User Input from tnxTower)	
Tower Height =	$H_t := 195 \cdot ft$	(User Input)	
Tower Width =	$W_t := 23.5 \cdot ft$	(User Input)	
Tower Position on Foundation (1=offset, 2=centered) =	$Pos_t := 2$	(User Input)	

Footing Data:

Overall Depth of Footing =	$D_f := 6.0 \cdot ft$	(User Input)	
Length of Pier =	$L_p := 4.0 \cdot ft$	(User Input)	
Extension of Pier Above Grade =	$L_{pag} := 0.5 \cdot ft$	(User Input)	
Diameter of Pier =	$d_p := 3.0 \cdot ft$	(User Input)	
Thickness of Footing =	$T_f := 2.5 \cdot ft$	(User Input)	
Width of Footing =	$W_f := 34.0 \cdot ft$	(User Input)	

Material Properties:

Concrete Compressive Strength =	$f_c := 3000 \cdot psi$	(User Input)	
Steel Reinforcment Yield Strength =	$f_y := 60000 \cdot psi$	(User Input)	
Internal Friction Angle of Soil =	$\Phi_s := 30 \cdot deg$	(User Input)	
Allowable Soil Bearing Capacity =	$q_s := 4000 \cdot psf$	(User Input)	
Unit Weight of Soil =	$\gamma_{soil} := 110 \cdot pcf$	(User Input)	
Unit Weight of Concrete =	$\gamma_{conc} := 150 \cdot pcf$	(User Input)	
Foundation Bouyancy =	$Bouyancy := 0$	(User Input)	(Yes=1 / No=0)
Depth to Neglect =	$n := 0 \cdot ft$	(User Input)	
Cohesion of Clay Type Soil =	$c := 0 \cdot ksf$	(User Input)	(Use 0 for Sandy Soil)
Seismic Zone Factor =	$Z := 2$	(User Input)	(UBC-1997 Fig 23-2)
Coefficient of Friction Between Concrete =	$\mu := 0.45$	(User Input)	

Pier Reinforcement:

Bar Size =	$BS_{pier} := 8$	(User Input)	
Bar Diameter =	$d_{bpier} := 1.0 \cdot in$	(User Input)	
Number of Bars =	$NB_{pier} := 20$	(User Input)	
Clear Cover of Reinforcement =	$Cvr_{pier} := 3 \cdot in$	(User Input)	
Reinforcement Location Factor =	$\alpha_{pier} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Coating Factor =	$\beta_{pier} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Concrete Strength Factor =	$\lambda_{pier} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Reinforcement Size Factor =	$\gamma_{pier} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Diameter of Tie =	$d_{Tie} := 4 \cdot in$	(User Input)	

Pad Reinforcement:

Bar Size =	$BS_{top} := 8$	(User Input)	(Top of Pad)
Bar Diameter =	$d_{btop} := 1.0 \cdot in$	(User Input)	(Top of Pad)
Number of Bars =	$NB_{top} := 34$	(User Input)	(Top of Pad)
Bar Size =	$BS_{bot} := 8$	(User Input)	(Bottom of Pad)
Bar Diameter =	$d_{bbot} := 1.000 \cdot in$	(User Input)	(Bottom of Pad)
Number of Bars =	$NB_{bot} := 34$	(User Input)	(Bottom of Pad)
Clear Cover of Reinforcement =	$Cvr_{pad} := 3.0 \cdot in$	(User Input)	
Reinforcement Location Factor =	$\alpha_{pad} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Coating Factor =	$\beta_{pad} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Concrete Strength Factor =	$\lambda_{pad} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Reinforcement Size Factor =	$\gamma_{pad} := 1.0$	(User Input)	(ACI-2008 12.2.4)

Calculated Factors:

Pier Reinforcement Bar Area = $A_{bpier} := \frac{\pi \cdot d_{bpier}^2}{4} = 0.785 \cdot in^2$

Pad Top Reinforcement Bar Area = $A_{btop} := \frac{\pi \cdot d_{btop}^2}{4} = 0.785 \cdot in^2$

Pad Bottom Reinforcement Bar Area = $A_{bbot} := \frac{\pi \cdot d_{bbot}^2}{4} = 0.785 \cdot in^2$

Coefficient of Lateral Soil Pressure = $K_p := \frac{1 + \sin(\Phi_s)}{1 - \sin(\Phi_s)} = 3$

Load Factor = $LF := 1$

Stability of Footing:

Adjusted Concrete Unit Weight = $\gamma_c := if(Bouyancy = 1, \gamma_{conc} - 62.4pcf, \gamma_{conc}) = 150 \cdot pcf$

Adjusted Soil Unit Weight = $\gamma_s := if(Bouyancy = 1, \gamma_{soil} - 62.4pcf, \gamma_{soil}) = 110 \cdot pcf$

Passive Pressure = $P_{pn} := K_p \cdot \gamma_s \cdot n + c \cdot 2 \cdot \sqrt{K_p} = 0 \cdot ksf$

$P_{pt} := K_p \cdot \gamma_s \cdot (D_f - T_f) + c \cdot 2 \cdot \sqrt{K_p} = 1.155 \cdot ksf$

$P_{top} := if[n < (D_f - T_f), P_{pt}, P_{pn}] = 1.155 \cdot ksf$

$P_{bot} := K_p \cdot \gamma_s \cdot D_f + c \cdot 2 \cdot \sqrt{K_p} = 1.98 \cdot ksf$

$P_{ave} := \frac{P_{top} + P_{bot}}{2} = 1.568 \cdot ksf$

$T_p := if[n < (D_f - T_f), T_f, (D_f - n)] = 2.5 \cdot ft$

$A_p := W_f \cdot T_p = 85 \cdot ft^2$

Ultimate Shear = $S_u := P_{ave} \cdot A_p = 133.238 \cdot kip$

Weight of Concrete = $WT_c := \left[\left(W_f^2 \cdot T_f\right) + (3) \cdot \left(\frac{d_p^2 \cdot \pi}{4} L_p\right)\right] \cdot \gamma_c = 446.223 \cdot kip$

Weight of Soil Above Footing = $WT_{s1} := \left[\left[W_f^2 - (3) \cdot \left(\frac{d_p^2 \cdot \pi}{4}\right)\right] \cdot \left(|L_p - L_{pag} - n|\right)\right] \cdot \gamma_s = 436.9 \cdot kip$

Tower Offset = $X_{t1} := \left[\frac{W_f}{2} - \frac{(W_t \cdot \cos(30 \cdot deg))}{2}\right]$ $X_{t2} := \frac{W_f}{2} - \frac{(W_t \cdot \cos(30 \cdot deg))}{3}$

$X_t := if(Pos_t = 1, X_{t1}, X_{t2}) = 10.216$

$X_{off1} := \frac{W_f}{2} - \left[\frac{(W_t \cdot \cos(30 \cdot deg))}{3} + X_t\right] = 0$ $X_{off2} := 0$

$X_{off} := if(Pos_t = 1, X_{off1}, X_{off2})$ $X_{off} = 0 \cdot ft$

Total Weight = $WT_{tot} := 0.9WT_c + 0.75WT_{s1} = 729.3 \cdot kip$

Resisting Moment = $M_r := (WT_{tot}) \cdot \frac{W_f}{2} + 0.9WT_t \cdot \left(\frac{W_f}{2} - X_{off}\right) + 0.75\left(S_u \cdot \frac{T_p}{3}\right) = 13751 \cdot kip \cdot ft$

Overturning Moment = $M_{ot} := OM + S_t \cdot (L_p + T_f) = 8782 \cdot kip \cdot ft$

Factor of Safety Actual = $FS := \frac{M_r}{M_{ot}} = 1.57$

Factor of Safety Required = $FS_{req} := 1$ $OverTurning\_Moment\_Check := if(FS \geq FS_{req}, "Okay", "No Good")$

$OverTurning\_Moment\_Check = "Okay"$

Shear Capacity in Pier:

Shear Resistance of Pier = $S_p := \frac{P_{ave} \cdot A_p + \mu \cdot WT_{tot}}{FS_{req}} = 461.41 \cdot kips$

$Shear\_Check := if(S_p > S_t, "Okay", "No Good")$

$Shear\_Check = "Okay"$

Bearing Pressure Caused by Footing:

Total Load = $Load_{tot} := WT_c + WT_{s1} + WT_t = 966 \cdot kip$

Area of the Mat = $A_{mat} := W_f^2 = 1.156 \times 10^3$

Section Modulus of Mat = $S := \frac{W_f^3}{6} = 6550.67 \cdot ft^3$

Maximum Pressure in Mat = $P_{max} := \frac{Load_{tot}}{A_{mat}} + \frac{M_{ot}}{S} = 2.176 \cdot ksf$

$Max\_Pressure\_Check := if(P_{max} < 0.75q_s, "Okay", "No Good")$

$Max\_Pressure\_Check = "Okay"$

Minimum Pressure in Mat = $P_{min} := \frac{Load_{tot}}{A_{mat}} - \frac{M_{ot}}{S} = -0.505 \cdot ksf$

$Min\_Pressure\_Check := if[(P_{min} \geq 0) \cdot (P_{min} < 0.75q_s), "Okay", "No Good"]$

$Min\_Pressure\_Check = "No Good"$

Distance to Resultant of Pressure Distribution = $X_p := \frac{P_{max}}{\frac{P_{max} - P_{min}}{W_f}} \cdot \frac{1}{3} = 9.199$

Distance to Kern = $X_k := \frac{W_f}{6} = 5.667$

Since Resultant Force is Not in Kern, Area to which Pressure is Applied Must be Reduced.

Eccentricity = $e := \frac{M_{ot}}{Load_{tot}} = 9.09$

Adjusted Soil Pressure = $P_a := \frac{2 \cdot Load_{tot}}{3 \cdot W_f \cdot \left(\frac{W_f}{2} - e\right)} = 2.395 \cdot ksf$

$q_{adj} := if(P_{min} < 0, P_a, P_{max}) = 2.395 \cdot ksf$

$Pressure\_Check := if(q_{adj} < 0.75q_s, "Okay", "No Good")$

$Pressure\_Check = "Okay"$

Concrete Bearing Capacity:

Strength Reduction Factor = $\Phi_c := 0.65$ (ACI-2008 9.3.2.2)

Bearing Strength Between Pier and Pad = $P_b := \Phi_c \cdot 0.85 \cdot f_c \cdot \frac{\pi \cdot d_p^2}{4} = 1.687 \times 10^3 \cdot kips$ (ACI-2008 10.14)

$Bearing\_Check := if(P_b > LF \cdot C_t, "Okay", "No Good")$

Bearing_Check = "Okay"

Shear Strength of Concrete:

Beam Shear: (Critical section located at a distance d from the face of Pier) (ACI 11.3.1.1)

$\phi_c := 0.85$ (ACI 9.3.2.5)

$d := T_f - Cvr_{pad} - d_{bbot} = 26 \cdot in$

$FL := LF \cdot \frac{C_t}{W_f^2} = 0.376 \cdot ksf$

$V_{req} := FL \cdot (X_t - .5 \cdot d_p - d) \cdot W_f = 83.795 \cdot kips$

$V_{Avail} := \phi_c \cdot 2 \cdot \sqrt{f_c \cdot psi} \cdot W_f \cdot d = 988 \cdot kip$ (ACI-2008 11.2.1.1)

$Beam\_Shear\_Check := if(V_{req} < V_{Avail}, "Okay", "No Good")$

Beam_Shear_Check = "Okay"

Punching Shear: (Critical Section Located at a distance of d/2 from the face of pier) (ACI 11.11.1.2)

Critical Perimeter of Punching Shear = $b_o := (d_p + d) \cdot \pi = 16.2$

Area Included Inside Perimeter = $A_{bo} := \frac{\pi \cdot (d_p + d)^2}{4} = 21$

Required Shear Strength = $V_{req} := FL \cdot (W_f^2 - A_{bo}) = 427 \cdot kips$

Available Shear Strength = $V_{Avail} := \phi_c \cdot 4 \cdot \sqrt{f_c \cdot psi} \cdot b_o \cdot d = 943.1 \cdot kip$ (ACI-2008 11.11.2.1)

$Punching\_Shear\_Check := if(V_{req} < V_{Avail}, "Okay", "No Good")$

Punching_Shear_Check = "Okay"

Steel Reinforcement in Pad:

Required Reinforcement for Bending:

Strength Reduction Factor = $\phi_m := .90$ (ACI-2008 9.3.2.1)

Maximum Moment in Pad = $M_{max} := 1400 \cdot kip \cdot ft$ (User Input)

Design Moment = $M_n := \frac{LF \cdot M_{max}}{\phi_m} = 1.556 \times 10^3 \cdot kips \cdot ft$

$$\beta := \begin{cases} 0.85 \text{ if } 2500 \cdot psi \le f_c \le 4000 \cdot psi \\ 0.65 \text{ if } f_c > 8000 \cdot psi \\ \left[0.85 - \left[\frac{\left(\frac{f_c}{psi} - 4000\right)}{1000}\right] \cdot 0.5\right] \text{ otherwise} \end{cases} = 0.85 \quad \text{(ACI-200810.2.7.3)}$$

$b_{eff} := W_t \cdot \cos(30 \cdot deg) + d_p = 280.219 \cdot in$

$A_s := \frac{M_n}{(f_y \cdot d)} = 11.966 \cdot in^2$

$a := \frac{A_s \cdot f_y}{\beta \cdot f_c \cdot b_{eff}} = 1.005 \cdot in$

$A_s := \frac{M_n}{f_y \cdot \left(d - \frac{a}{2}\right)} = 12.202 \cdot in^2$

$\rho := \frac{A_s}{b_{eff} d} = 0.0201 \cdot in$

Required Reinforcement for Temperature and Shrinkage:

$$\rho_{sh} := \begin{cases} .0018 & \text{if } f_y \geq 60000 \cdot psi \\ .0020 & \text{otherwise} \end{cases} = 0.0018$$ (ACI-2008 7.12.2.1)

Check Bottom Bars:

$$As := if\left(\rho \geq \rho_{sh}, A_s, \rho_{sh} \cdot \frac{b_{eff}}{2} \cdot d\right) = 6.6 \cdot in^2$$

$$As_{prov} := A_{bbot} \cdot NB_{bot} = 26.7 \cdot in^2$$

$$Pad\_Reinforcement\_Bot := if\left(As_{prov} > As, "Okay", "No\ Good"\right)$$

Pad_Reinforcement_Bot = "Okay"

Check top Bars:

$$As := if\left(\rho \geq \rho_{sh}, A_s, \rho_{sh} \cdot \frac{b_{eff}}{2} \cdot d\right) = 6.6 \cdot in^2$$

$$As_{prov} := A_{btop} \cdot NB_{top} = 26.7 \cdot in^2$$

$$Pad\_Reinforcement\_Top := if\left(As_{prov} > As, "Okay", "No\ Good"\right)$$

Pad_Reinforcement_Top = "Okay"

Developement Length Pad Reinforcement:

Bar Spacing =

$$B_{sPad} := \frac{W_f - 2 \cdot Cvr_{pad} - NB_{bot} \cdot d_{bbot}}{NB_{bot} - 1} = 11.15 \cdot in$$

Spacing or Cover Dimension =

$$c := if\left(Cvr_{pad} < \frac{B_{sPad}}{2}, Cvr_{pad}, \frac{B_{sPad}}{2}\right) = 3 \cdot in$$

Transverse Reinforcement Index =

$$k_{tr} := 0$$ (ACI-2008 12.2.3)

$$L_{dbt} := \frac{3 \cdot f_y \alpha_{pad} \cdot \beta_{pad} \cdot \gamma_{pad} \cdot \lambda_{pad}}{40 \cdot \sqrt{f_c \cdot psi} \cdot \frac{c + k_{tr}}{d_{bbot}}} \cdot d_{bbot} = 27.4 \cdot in$$

Minimum Development Length =

$$L_{dbmin} := 12 \cdot in$$ (ACI-2008 12.2.1)

$$L_{dbtCheck} := if\left(L_{dbt} \geq L_{dbmin}, "Use\ L.dbt", "Use\ L.dbmin"\right) = "Use\ L.dbt"$$

Available Length in Pad =

$$L_{Pad} := \frac{W_f}{2} - \frac{W_t}{2} - Cvr_{pad} = 60 \cdot in$$

$$Lpad\_Check := if\left(L_{Pad} > L_{dbt}, "Okay", "No\ Good"\right)$$

Lpad_Check = "Okay"

Steel Reinforcement in Pier:

Area of Pier = $A_p := \frac{\pi \cdot d_p^2}{4} = 1017.88 \cdot in^2$

$A_{smin} := 0.01 \cdot 0.5 \cdot A_p = 5.09 \cdot in^2$ (ACI-2008 10.8.4 & 10.9.1)

$A_{sprov} := NB_{pier} \cdot A_{bpier} = 15.71 \cdot in^2$

$Steel\_Area\_Check := if(A_{sprov} > A_{smin}, "Okay", "No Good")$

Steel_Area_Check = "Okay"

Bar Spacing In Pier = $B_{sPier} := \frac{d_p \cdot \pi}{NB_{pier}} - d_{bpier} = 4.655 \cdot in$

Diameter of Reinforcement Cage = $Diam_{cage} := d_p - 2 \cdot Cvr_{pier} = 30 \cdot in$

Maximum Moment in Pier = $M_p := S_t \cdot (L_p) \cdot LF = 3648 \cdot in \cdot kips$

Pier Check evaluated from outside program and results are listed below;

$(D \ N \ n \ P_u \ M_{xu}) := \left(d_p \cdot 12 \ \ NB_{pier} \ \ BS_{pier} \ \ \frac{C_t \cdot 1.333}{kips} \ \ \frac{M_p}{in \cdot kips}\right)$

$(D \ N \ n \ P_u \ M_{xu}) = (36 \ \ 20 \ \ 8 \ \ 579.855 \ \ 3.648 \times 10^3)$

$(\phi P_n \ \ \phi M_{xn} \ \ f_{sp} \ \ \rho) := (0 \ \ 0 \ \ 0 \ \ 0)$

$(\phi P_n \ \ \phi M_{xn} \ \ f_{sp} \ \ \rho) := \phi P'_n(D, N, n, P_u, M_{xu})^T$

$(\phi P_n \ \ \phi M_{xn} \ \ f_{sp} \ \ \rho) = (1.503 \times 10^3 \ \ 9.458 \times 10^3 \ \ -29.23 \ \ 0.016)$

$Axial\_Load\_Check := if(\phi P_n \geq P_u, "Okay", "No Good")$

Axial_Load_Check = "Okay"

$Bending\_Check := if(\phi M_{xn} \geq M_{xu}, "Okay", "No Good")$

Bending_Check = "Okay"

Development Length Pier Reinforcement:

Available Length in Foundation:

$L_{pier} := L_p - Cvr_{pier} = 45 \cdot in$

$L_{pad} := T_f - Cvr_{pad} = 27 \cdot in$

Tension: (ACI-2008 12.2.3)

Spacing or Cover Dimension =

$c := if\left(Cvr_{pier} < \frac{B_{sPier}}{2}, Cvr_{pier}, \frac{B_{sPier}}{2}\right) = 2.327 \cdot in$

Transverse Reinforcement =

$k_{tr} := 0$ (ACI-2008 12.2.3)

$L_{dbt} := \frac{3 \cdot f_y \cdot \alpha_{pier} \cdot \beta_{pier} \cdot \gamma_{pier} \cdot \lambda_{pier}}{40 \cdot \sqrt{f_c \cdot psi} \cdot \left(\frac{c + k_{tr}}{d_{bpier}}\right)} \cdot d_{bpier} = 35.3 \cdot in$

Minimum Development Length =

$L_{dh} := \frac{1200 \cdot d_{bpier}}{\sqrt{\frac{f_c}{psi}}} \cdot .7 = 15.336 \cdot in$ (ACI 12.2.1)

Pier reinforcement bars are standard 90 degree hooks and therefore developement in the pad is computed as follows:

$L_{db} := \max\left(L_{dbt}, L_{dbmin}\right) = 35.3 \cdot in$

$L_{tension\_Check} := if\left(L_{pier} + L_{pad} > L_{dbt}, "Okay", "No Good"\right)$

$L_{tension\_Check} = "Okay"$

Compression: (ACI-2008 12.3.2)

$L_{dbc1} := \frac{.02 \cdot d_{bpier} \cdot f_y}{\sqrt{f_c \cdot psi}} = 21.909 \cdot in$

$L_{dbmin} := 0.0003 \cdot \frac{in^2}{lb} \cdot \left(d_{bpier} \cdot f_y\right) = 18 \cdot in$

$L_{dbc} := if\left(L_{dbc1} \geq L_{dbmin}, L_{dbc1}, L_{dbmin}\right) = 21.909 \cdot in$

$L_{compression\_Check} := if\left(L_{pier} + L_{pad} > L_{dbc}, "Okay", "No Good"\right)$

$L_{compression\_Check} = "Okay"$

verizon fuze | RFDS

EAST > North East > New England > New England West > NORTHFORD CT

Cheiban, Ziad - ziad.cheiban@verizonwireless.com - 4/22/2021 17:38:22

Project Details

Carrier Aggregation:	false
MPT Id:	103583
eCIP-0:	false
Project Name:	NORTHFORD CT-CXR-850-PCS-201507
FUZE Project ID:	2027561
Designed Sector Carrier 4G:	12
Designed Sector Carrier 5G:	N/A
Additional Sector Carrier 4G:	N/A
Additional Sector Carrier 5G:	N/A
SiteTraker Project Id:	
FP Solution Type & Tech Type:	;
Suffix:	Rev3_2021-04-22

Location Information

Site ID:	324546
E-NodeB ID:	064174
PSLC:	469137
Switch Name:	Wallingford 1
Tower Owner:	
Tower Type:	Guyed structure
Site Type:	MACRO
Street Address:	88 Parsonage Road
City:	Northford
State:	CT
Zip Code:	06472
County:	New Haven
Latitude:	41.368053 / 41° 22' 4.9908" N
Longitude:	-72.810553 / 72° 48' 37.9908" W

RFDS Project Scope:

850 & PCS Carrier Add
Use low-low quad diplexers to split 700 and 850 MHz

Rev3_2021-04-22: Changed diplexer to Commscope. Added RET table and Plumbing diagram
Rev2: Update equipment inventory

Antenna Summary

Added

700	850	1900	AWS	Make	Model	Centerline	Tip Height	Azimuth	RET	4xRx	Inst. Type	Quantity
LTE		LTE	LTE	ANDREW	JAHH-65B-R3B	146	149	30(01) 150(02) 260(03)	true	true	PHYSICAL	3
	LTE			COMMSCOPE	JAHH-65B-R3B	146	149	30(01) 150(02) 260(03)	true	true	PHYSICAL	3

Removed

700	850	1900	AWS	Make	Model	Centerline	Tip Height	Azimuth	RET	4xRx	Inst. Type	Quantity
			LTE	AMPHENOL	BXA-171063-12CF-EDIN-5 (269701)	146	149	30(D1) 150(D2) 270(D3)	false	false	PHYSICAL	3
LTE				ANTEL	BXA-70063-6CF	146	149	30(D1) 150(D2)	false	false	PHYSICAL	2
LTE				ANTEL	BXA-70063-6CF-8-750MHZ (275134)	146	149	260(D3)	false	false	PHYSICAL	1
				AMPHENOL	BXA-171063	145	148	30(D1) 150(D2) 270(D3)	false	false	PHYSICAL	3

Retained

700	850	1900	AWS	Make	Model	Centerline	Tip Height	Azimuth	RET	4xRx	Inst. Type	Quantity
	CDMA			ANDREW	LNX-6513DS-VTM	145	147.3	30(D1) 150(D2) 260(D3)	false	false	PHYSICAL	3

Added: 6 **Removed:** 9 **Retained:** 3

Equipment Summary

Added

Equipment Type	Location	700	850	1900	AWS	Make	Model	Cable Length	Cable Size	Install Type	Quantity
Mount	Tower					COMMSCOPE	BSAMNT-SBS-2-2			PHYSICAL	3
Diplexer	Tower					Commscope	CBC78T-DS-43-2X			PHYSICAL	3
RRU	Tower			LTE	LTE	Samsung	B2/B66A RRH-BR049 (RFV01U-D1A)			PHYSICAL	3
RRU	Tower	LTE	LTE			Samsung	B5/B13 RRH-BR04C (RFV01U-D2A)			PHYSICAL	3
Fiber	Tower									PHYSICAL	1
OVP Box	Tower									PHYSICAL	1

Removed

Equipment Type	Location	700	850	1900	AWS	Make	Model	Cable Length	Cable Size	Install Type	Quantity
RRU	Tower					ALU	RH_2X40-AWS			PHYSICAL	3
RRU	Tower	LTE				Nokia	UHBA B13 RRH 4x30			PHYSICAL	3
RRU	Tower				LTE	Nokia	UHID B4 RRH 2x40			PHYSICAL	3
Diplexer	Tower									PHYSICAL	3
RRU	Shelter					NOKIA	RH_2X60-700U			PHYSICAL	3

Retained

Equipment Type	Location	700	850	1900	AWS	Make	Model	Cable Length	Cable Size	Install Type	Quantity
Coaxial Cables	Tower									PHYSICAL	12
Fiber	Tower									PHYSICAL	1
OVP Box	Tower									PHYSICAL	1

Service Info

700 MHz LTE	0000			0001		
Sector	**D1**	**D2**	**D3**	**01**	**02**	**03**
Azimuth	30	150	260	30	150	260
Cell / ENode B ID	064174	064174	064174	064174	064174	064174
Antenna Model	BXA-70063-6CF	BXA-70063-6CF	BXA-70063-6CF-8-750MHZ (275134)	JAHH-65B-R3B	JAHH-65B-R3B	JAHH-65B-R3B
Antenna Make	ANTEL	ANTEL	ANTEL	ANDREW	ANDREW	ANDREW
Antenna Centerline(Ft)	146	146	146	146	146	146
Mechanical Down-Tilt(Deg.)	2	2	3	0	0	4
Electrical Down-Tilt	2	2	8	4	4	8
Tip Height	149	149	149	149	149	149
Regulatory Power	137.33	137.33	137.33	70.4	70.4	68.13
Total ERP (W)						
TMA Make						
TMA Model						
RRU Make	Nokia	Nokia	Nokia	Samsung	Samsung	Samsung
RRU Model	UHBA B13 RRH 4x30	UHBA B13 RRH 4x30	UHBA B13 RRH 4x30	B5/B13 RRH-BR04C (RFV01U-D2A)	B5/B13 RRH-BR04C (RFV01U-D2A)	B5/B13 RRH-BR04C (RFV01U-D2A)
Number of Tx, Rx Lines	2,4	2,4	2,4	4,4	4,4	4,4
Position						
Transmitter Id	1949352	1949431	1949436	1957036	1957039	1957042
Source	ATOLL_API	ATOLL_API	ATOLL_API	ATOLL_API	ATOLL_API	ATOLL_API

850 MHz LTE				0001		
Sector				**01**	**02**	**03**
Azimuth				30	150	260
Cell / ENode B ID				064174	064174	064174
Antenna Model				JAHH-65B-R3B	JAHH-65B-R3B	JAHH-65B-R3B
Antenna Make				COMMSCOPE	COMMSCOPE	COMMSCOPE
Antenna Centerline(Ft)				146	146	146
Mechanical Down-Tilt(Deg.)				0	0	4
Electrical Down-Tilt				4	10	8
Tip Height				149	149	149
Regulatory Power				322.71	392.48	314.64
Total ERP (W)						
TMA Make						
TMA Model						
RRU Make				Samsung	Samsung	Samsung
RRU Model				B5/B13 RRH-BR04C (RFV01U-D2A)	B5/B13 RRH-BR04C (RFV01U-D2A)	B5/B13 RRH-BR04C (RFV01U-D2A)
Number of Tx, Rx Lines				4,4	4,4	4,4
Position						
Transmitter Id				1957391	1957392	1957394
Source				ATOLL_API	ATOLL_API	ATOLL_API

850 MHz CDMA	0000			0001		
Sector	**D1**	**D2**	**D3**	**D1**	**D2**	**D3**
Azimuth	30	150	260	30	150	260
Cell / ENode B ID						
Antenna Model	LNX-6513DS-VTM	LNX-6513DS-VTM	LNX-6513DS-VTM	LNX-6513DS-VTM	LNX-6513DS-VTM	LNX-6513DS-VTM
Antenna Make	ANDREW	ANDREW	ANDREW	ANDREW	ANDREW	ANDREW
Antenna Centerline(Ft)	145	145	145	145	145	145
Mechanical Down-Tilt(Deg.)	0	0	5	0	0	5
Electrical Down-Tilt	0	0	6	0	0	6
Tip Height	147.3	147.3	147.3	147.3	147.3	147.3
Regulatory Power	391.74	391.74	391.74	391.74	391.74	391.74
Total ERP (W)						
TMA Make						
TMA Model						
RRU Make						
RRU Model						
Number of Tx, Rx Lines						
Position						
Transmitter Id						
Source	ATOLL_API	ATOLL_API	ATOLL_API	ATOLL_API	ATOLL_API	ATOLL_API

1900 MHz LTE

				0001		
Sector				**01**	**02**	**03**
Azimuth				30	150	260
Cell / ENode B ID				064174	064174	064174
Antenna Model				JAHH-65B-R3B	JAHH-65B-R3B	JAHH-65B-R3B
Antenna Make				ANDREW	ANDREW	ANDREW
Antenna Centerline(Ft)				146	146	146
Mechanical Down-Tilt(Deg.)				0	0	0
Electrical Down-Tilt				5	5	5
Tip Height				149	149	149
Regulatory Power				287.98	287.98	287.98
Total ERP (W)						
TMA Make						
TMA Model						
RRU Make				Samsung	Samsung	Samsung
RRU Model				B2/B66A RRH-BR049 (RFV01U-D1A)	B2/B66A RRH-BR049 (RFV01U-D1A)	B2/B66A RRH-BR049 (RFV01U-D1A)
Number of Tx, Rx Lines				4,4	4,4	4,4
Position						
Transmitter Id				1957037	1957040	1957043
Source				ATOLL_API	ATOLL_API	ATOLL_API

2100 MHz LTE

	0000			0001		
Sector	**D1**	**D2**	**D3**	**01**	**02**	**03**
Azimuth	30	150	270	30	150	260
Cell / ENode B ID	064174	064174	064174	064174	064174	064174
Antenna Model	BXA-171063-12CF-EDIN-5 (269701)	BXA-171063-12CF-EDIN-5 (269701)	BXA-171063-12CF-EDIN-5 (269701)	JAHH-65B-R3B	JAHH-65B-R3B	JAHH-65B-R3B
Antenna Make	AMPHENOL	AMPHENOL	AMPHENOL	ANDREW	ANDREW	ANDREW
Antenna Centerline(Ft)	146	146	146	146	146	146
Mechanical Down-Tilt(Deg.)	3	6	3	0	0	0
Electrical Down-Tilt	5	5	5	5	5	5
Tip Height	149	149	149	149	149	149
Regulatory Power	169.72	169.72	169.72	146.33	146.33	146.33
Total ERP (W)						
TMA Make						
TMA Model						
RRU Make	Nokia	Nokia	Nokia	Samsung	Samsung	Samsung
RRU Model	UHID B4 RRH 2x40	UHID B4 RRH 2x40	UHID B4 RRH 2x40	B2/B66A RRH-BR049 (RFV01U-D1A)	B2/B66A RRH-BR049 (RFV01U-D1A)	B2/B66A RRH-BR049 (RFV01U-D1A)
Number of Tx, Rx Lines	2,4	2,4	2,4	4,4	4,4	4,4
Position						
Transmitter Id	1949430	1949435	1949440	1957038	1957041	1957044
Source	ATOLL_API	ATOLL_API	ATOLL_API	ATOLL_API	ATOLL_API	ATOLL_API

Service Comments

Callsigns Per Antenna

Sector	Antenna Ma	Antenna Mc	Ant CL Height AGL	Tip Height	Azimuth (TI	Electrical Tilt	Mechanical Tilt	Gain	Beamwidth	Regulatory Power	Callsigns						
											700	850	1900	2100	28 GHz	31 GHz	39 GHz
D3	ANDREW	LNX-6513DS-VTM	145	147.3	260	6	5	13	64.75	290.42		KNKA313					
D3	ANDREW	LNX-6513DS-VTM	145	147.3	260	6	5	13	64.75	391.74		KNKA313					
D1	ANDREW	LNX-6513DS-VTM	145	147.3	30	0	0	13	65.5	391.74		KNKA313					
01	COMMSCO	JAHH-65B-R3B	146	149	30	4	0	12.81	65.25	322.71		KNKA313					
02	ANDREW	JAHH-65B-R3B	146	149	150	5	0	16.186001	64.5	287.98			KNLH262 WQEM953				
01	ANDREW	JAHH-65B-R3B	146	149	30	5	0	16.186001	64.5	287.98			KNLH262 WQEM953				
03	ANDREW	JAHH-65B-R3B	146	149	260	5	0	16.256001	66.5	146.33				WQGA906 WQGB280			
02	ANDREW	JAHH-65B-R3B	146	149	150	4	0	12.218	67.75	70.4	WQJQ689						
D1	ANDREW	LNX-6513DS-VTM	145	147.3	30	0	0	13	65.5	290.42		KNKA313					
02	ANDREW	JAHH-65B-R3B	146	149	150	5	0	16.256001	66.5	146.33				WQGA906 WQGB280			
03	ANDREW	JAHH-65B-R3B	146	149	260	8	4	12.076	68.25	68.13	WQJQ689						
D2	ANDREW	LNX-6513DS-VTM	145	147.3	150	0	0	13	65.5	391.74		KNKA313					
02	COMMSCO	JAHH-65B-R3B	146	149	150	10	0	13.66	65.75	392.48		KNKA313					
03	ANDREW	JAHH-65B-R3B	146	149	260	5	0	16.186001	64.5	287.98			KNLH262 WQEM953				
01	ANDREW	JAHH-65B-R3B	146	149	30	4	0	12.218	67.75	70.4	WQJQ689						
D2	ANDREW	LNX-6513DS-VTM	145	147.3	150	0	0	13	65.5	290.42		KNKA313					
03	COMMSCO	JAHH-65B-R3B	146	149	260	8	4	12.7	65.5	314.64		KNKA313					
01	ANDREW	JAHH-65B-R3B	146	149	30	5	0	16.256001	66.5	146.33				WQGA906 WQGB280			

Callsigns

Callsign	Market	Radio Code	Market Number	Block	State	County	Licensee Name	Wholly Owned	Total MHZ	Freq Range 1	Freq Range 2	Freq Range 3	Freq Range 4	Regulatory Power	Threshold (W)	POPs/Sq Mi	Status	Action	Approved for Insvc
WQJQ689	Northeast	WU	REA001	C	CT	New Haven	Cellco Partnership	Yes	22.000	746.000-757.000	776.000-787.000	.000-.000	.000-.000	70.4	1000	1426.75	Active	added	Yes
KNKA313	New Haven-West Haven-Waterbury - Meriden, CT	CL	CMA049	A	CT	New Haven	Cellco Partnership	Yes	25.000	824.000-835.000	869.000-880.000	845.000-846.500	890.000-891.500	391.74	500	1426.75	Active	added	Yes
WQEM953	New Haven-Waterbury - Meriden, CT	CW	BTA318	C	CT	New Haven	Cellco Partnership	Yes	10.000	1895.000-1900.000	1975.000 1980.000	.000-.000	.000-.000	287.98	1640	1426.75	Active	added	Yes
KNLH262	New Haven-Waterbury - Meriden, CT	CW	BTA318	F	CT	New Haven	Cellco Partnership	Yes	10.000	1890.000-1895.000	1970.000 1975.000	.000-.000	.000-.000	287.98	1640	1426.75	Active	added	Yes
WQGB280	New Haven-West Haven-Waterbury - Meriden, CT	AW	CMA049	A	CT	New Haven	Cellco Partnership	Yes	20.000	1710.000 1720.000	2110.000 2120.000	.000-.000	.000-.000	146.33	1640	1426.75	Active	added	Yes
WQGA906	New York-No. New Jer.-Long Island, NY-NJ-CT-PA-MA-	AW	BEA010	B	CT	New Haven	Cellco Partnership	Yes	20.000	1720.000 1730.000	2120.000-2130.000	.000-.000	.000-.000	146.33	1640	1426.75	Active	added	Yes
WQCS396	New Haven-Waterbury - Meriden, CT	CW	BTA318	C	CT	New Haven	Cellco Partnership	Yes	10.000	1905.000-1910.000	1985.000-1990.000	.000-.000	.000-.000		1640	1426.75	Active		Yes
WPOH945	New Haven-Waterbury - Meriden, CT	LD	BTA318	A	CT	New Haven	Cellco Partnership	Yes	300.000	29100.000-29250.000	31075.000-31225.000	.000-.000	.000-.000			1426.75	Active		No
WPLM399	New Haven-Waterbury - Meriden, CT	LD	BTA318	B	CT	New Haven	Cellco Partnership	Yes	150.000	31000.000-31075.000	31225.000-31300.000	.000-.000	.000-.000			1426.75	Active		No

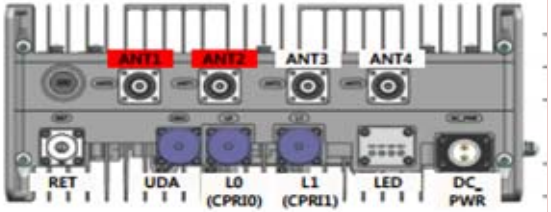
WRBA734	New Haven-Water - Meriden, CT	UU	BTA318	L1	CT	New Haven	Cellco Partnership	Yes	325.000	27600.000-27925.000	.000-.000	.000-.000	.000-.000			1426.75	Active		Yes
WRBA735	New Haven-Water - Meriden, CT	UU	BTA318	L2	CT	New Haven	Cellco Partnership	Yes	325.000	27925.000-27950.000	28050.000-28350.000	.000-.000	.000-.000			1426.75	Active		Yes
WRHD609	New York, NY	UU	PEA001	M1	CT	New Haven	Straight Path um, LLC	Yes	100.000	37600.000-37700.000	.000-.000	.000-.000	.000-.000			1426.75	Active		Yes
WRHD610	New York, NY	UU	PEA001	M10	CT	New Haven	Straight Path um, LLC	Yes	100.000	38500.000-38600.000	.000-.000	.000-.000	.000-.000			1426.75	Active		Yes
WRHD611	New York, NY	UU	PEA001	M2	CT	New Haven	Straight Path um, LLC	Yes	100.000	37700.000-37800.000	.000-.000	.000-.000	.000-.000			1426.75	Active		Yes
WRHD612	New York, NY	UU	PEA001	M3	CT	New Haven	Straight Path um, LLC	Yes	100.000	37800.000-37900.000	.000-.000	.000-.000	.000-.000			1426.75	Active		Yes
WRHD613	New York, NY	UU	PEA001	M4	CT	New Haven	Straight Path um, LLC	Yes	100.000	37900.000-38000.000	.000-.000	.000-.000	.000-.000			1426.75	Active		Yes
WRHD614	New York, NY	UU	PEA001	M5	CT	New Haven	Straight Path um, LLC	Yes	100.000	38000.000-38100.00	.000-.000	.000-.000	.000-.000			1426.75	Active		Yes
WRHD615	New York, NY	UU	PEA001	M6	CT	New Haven	Straight Path um, LLC	Yes	100.000	38100.000-38200.000	.000-.000	.000-.000	.000-.000			1426.75	Active		Yes
WRHD616	New York, NY	UU	PEA001	M7	CT	New Haven	Straight Path um, LLC	Yes	100.000	38200.000-38300.000	.000-.000	.000-.000	.000-.000			1426.75	Active		Yes
WRHD617	New York, NY	UU	PEA001	M8	CT	New Haven	Straight Path um, LLC	Yes	100.000	38300.000-38400.000	.000-.000	.000-.000	.000-.000			1426.75	Active		Yes
WRHD618	New York, NY	UU	PEA001	M9	CT	New Haven	Straight Path um, LLC	Yes	100.000	38400.000-38500.00	.000-.000	.000-.000	.000-.000			1426.75	Active		Yes
WRHD619	New York, NY	UU	PEA001	N1	CT	New Haven	Straight Path um, LLC	Yes	100.000	38600.000-38700.00	.000-.000	.000-.000	.000-.000			1426.75	Active		No

WRLD516	D09009 - New Haven, CT	PL	D09009	0	CT	New Haven	Verizon Wireless Network Procure LP	Yes	100.000	3550.000-3650.000	.000-.000	.000-.000	.000-.000			.00	Active		Yes
WRLD517	D09009 - New Haven, CT	PL	D09009	0	CT	New Haven	Verizon Wireless Network Procure LP	Yes	100.000	3550.000-3650.000	.000-.000	.000-.000	.000-.000			.00	Active		Yes
WRLD518	D09009 - New Haven, CT	PL	D09009	0	CT	New Haven	Verizon Wireless Network Procure LP	Yes	100.000	3550.000-3650.000	.000-.000	.000-.000	.000-.000			.00	Active		Yes

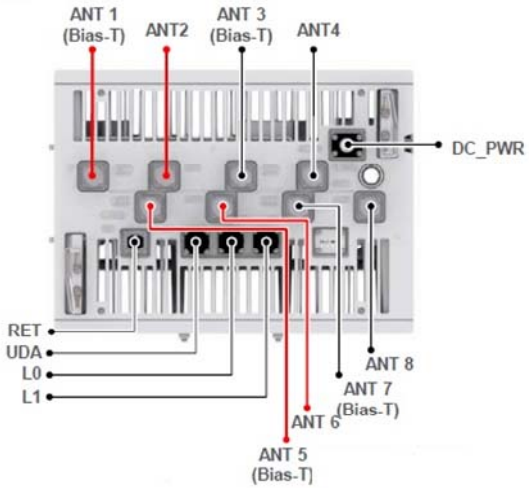
- Port 1 & 2 are for low band (698-787 MHz).
- Port 3 & 4 are for low band (824-894 MHz).
- Port 3,4,5, & 6 are for high band (1695-2360 MHz).
- Antenna Smart Bias Tee (SBT) is through port 1 for low band and port 5 for high band.
- AISG cable is only needed when drawn in the diagrams below, if it is not drawn then SBT is enough to control all RET motors.
- Not all SBT ports are needed to control RET, only green port connection to green port will control RET.

RET DC signal pass for RET
(Port that will control RET)

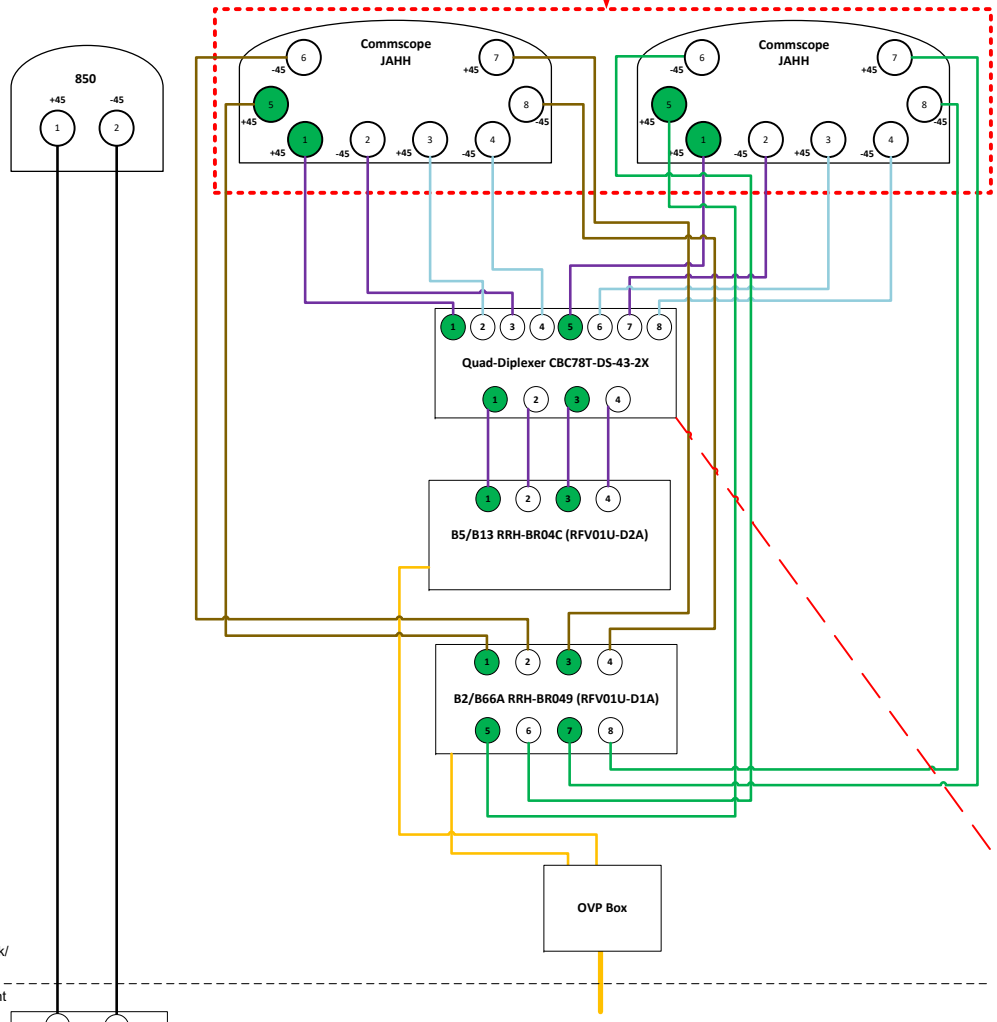
B5/B13 RRH-BR04C (RFV01U-D2A)



B2/B66A RRH-BR049 (RFV01U-D1A)



BSAMNT-SBS-2-2



DC signal capable Port

AISG Cable

RET DC signal pass for RET
(Port that will control RET)

Hybriflex cables

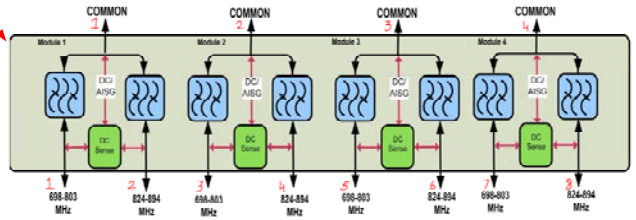
Comments:

Diagram shows configuration as viewed from standing behind the antennas.

Antennas will be installed in that order from left to right.

Cap and weatherproof unused antenna ports.

All plumbing diagram colors are irrelevant except for AISG & Hybriflex cable. (For the coax colors follow Coax Colors guide above)



Sector	Antenna Desc	Base Station ID	Sector ID
Alpha	700	064174_1	064174_1
Alpha	850	064174_1_6	064174_1_6
Alpha	AWS	064174_1_2	064174_1_2
Alpha	PCS	064174_1_4	064174_1_4
Beta	700	064174_2	064174_2
Beta	850	064174_2_6	064174_2_6
Beta	AWS	064174_2_2	064174_2_2
Beta	PCS	064174_2_4	064174_2_4
Gamma	700	064174_3	064174_3
Gamma	850	064174_3_6	064174_3_6
Gamma	AWS	064174_3_2	064174_3_2
Gamma	PCS	064174_3_4	064174_3_4

March 6, 2018
July 12, 2018 (Rev.1)
November 27, 2018 (Rev.2)
December 6, 2018 (Rev.3)
August 18, 2021 (Rev.4)

Verizon Wireless
20 Alexander Drive
Wallingford, CT 06492

RE: Site Name: NORTHFORD CT
Site Address: 88 Parsonage Road
Northford, CT 06472

To Whom It May Concern:

Hudson Design Group LLC (HDG) has been authorized by Verizon Wireless to perform a mount analysis on the existing Verizon antenna/RRH mounts to determine their capability of supporting the following additional loading:

- (3) LNX-6513DS-VTM Antennas (54.8"x11.9"x7.1" – Wt. = 33 lbs. /each)
- (1) Junction Box (28.9"x15.7"x10.3" – Wt. = 32 lbs. /each) (tower mounted)
- **(6) JAHH-65B-R3B Antennas (72.0" x13.8" x8.2" – Wt. = 64 lbs. /each)**
- **(3) B5/B13 RRH-BR04C RRH's (15.0"x15.0"x8.1" – Wt. = 82 lbs. /each)**
- **(3) B2/B66A RRH-BR049 RRH's (15.0"x15.0"x10.0" – Wt. = 98 lbs. /each)**
- **(3) CBC78T-DS-43-2X Diplexers (9.7"x6.9"x6.4" – Wt. = 21 lbs.)**
- **(1) Junction Box (28.9"x15.7"x10.3" – Wt. = 32 lbs. /each) (tower mounted)**

**Proposed equipment shown in bold*

No original structural design documents or fabrication drawings were available for the existing mounts. HDG's subconsultant, ProVertic LLC, conducted a survey climb and mapping of the existing Verizon antenna mounts on February 15, 2018.

Mount Analysis Methods:

- This analysis was conducted in accordance with EIA/TIA-222-G, Structural Standards for Steel Antenna Towers and Antenna Supporting Structures, the International Building Code 2015 with 2018 Connecticut State Building Code, and AT&T Mount Technical Directive – R13.

- HDG considers this mount to be asymmetrical and has applied wind loads in 30 degree increments all around the mount. Per TIA-222-G Annex B, the max basic wind speed for this site is equal to 115 mph with a max basic wind speed with ice of 50 mph and a max ice thickness of 1.0 in. Per Appendix N of the Connecticut State Building Code, an ultimate wind speed of 130 mph converted to a nominal wind speed of 101 mph and an escalated ice thickness of 2.32 in was used for this analysis.

- HDG considers this site to be exposure category C; tower is located near large, flat, open, terrain/grasslands.

- HDG considers this site to be topographic category 1; tower is located on flat terrain or the bottom of a hill or ridge.

- The existing mount is secured to the existing tower with U-Bolts. The connection is considered OK by visual inspection.

Based on our evaluation, we have determined that the existing mounts **ARE NOT CAPABLE** of supporting the proposed installation. HDG recommends the following modifications:

- **Proposed 2" std. (2.38" O.D.) pipe brace secured to the mount and adjacent tower leg (typ. of 1 per sector, total of 3).**

- **Relocate existing 2" std. (2.38" O.D.) pipe brace; secure to pipe mast at antenna position 4 and adjacent tower leg (typ. of 1 per sector, total of 3).**

- **Proposed 2-1/2" std. (2.88" O.D.) pipe mast behind new JAHH-65B-R3B antennas secured to the existing mount face (typ. of 1 per sector, total of 3).**

- **Proposed sector frame stabilizer, SitePro1 P/N SFS-V-L (or approved equal), secured to existing horizontal face pipe and adjacent tower leg (typ. of 1 per sector, total of 3).**

	Component	Controlling Load Case	Stress Ratio	Pass/Fail
Existing Mount Rating	5	LC3	160%	**FAIL**
Modified Mount Rating	19	LC3	93%	**PASS**

Reference Documents:

- Mount mapping report prepared by ProVertic LLC.

This determination was based on the following limitations and assumptions:

1. HDG is not responsible for any modifications completed prior to and hereafter which HDG was not directly involved.
2. All structural members and their connections are assumed to be in good condition and are free from defects with no deterioration to its member capacities.
3. All antennas, coax cables and waveguide cables are assumed to be properly installed and supported as per the manufacturer's requirements.
4. The existing mount has been adequately secured to the tower structure per the mount manufacturer's specifications.
5. All components pertaining to Verizon's mounts must be tightened and re-plumbed prior to the installation of new appurtenances.
6. HDG performed a localized analysis on the mount itself and not on the supporting tower structure.

Please feel free to contact our office should you have any questions.

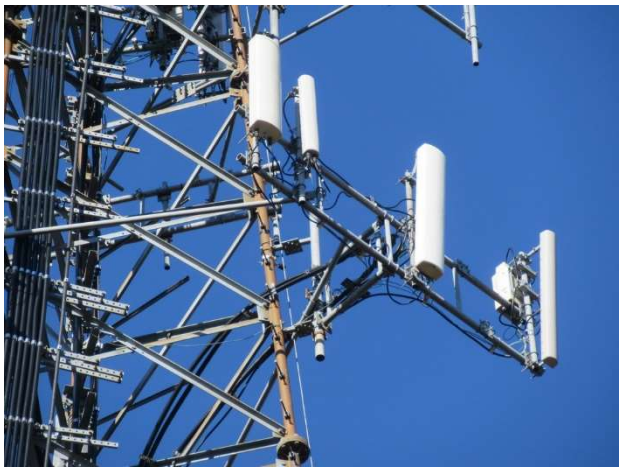
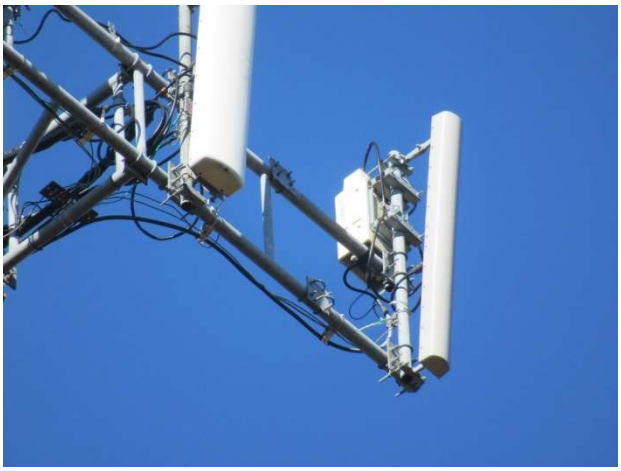
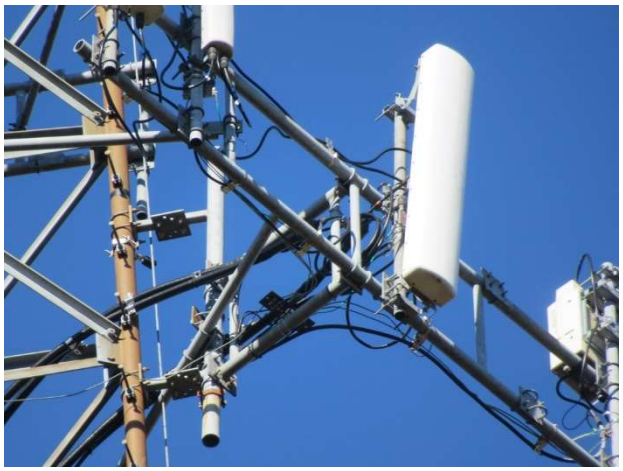
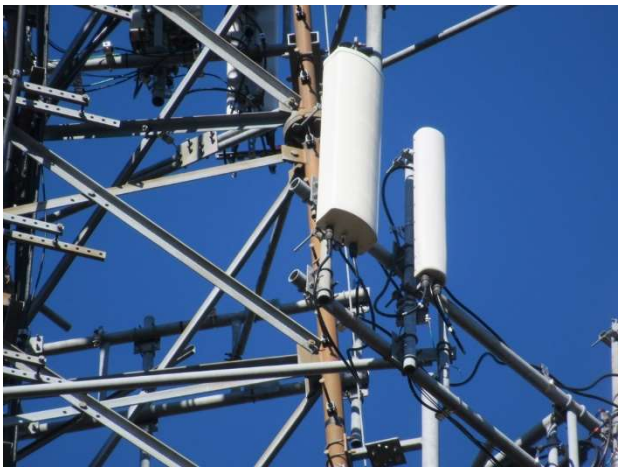
Respectfully Submitted,
Hudson Design Group LLC

Michael Cabral
Vice President

STATE OF CONNECTICUT * DANIEL HAMM * LICENSED PROFESSIONAL ENGINEER

Daniel P. Hamm, PE
Principal

FIELD PHOTOS:



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02/15/2018 14:19

HUDSON
Design Group LLC

Wind & Ice
Calculations

Date: 8/18/2021
Project Name: NORTHFORD CT
Designed By: CL **Checked By:** MSC

HUDSON Design Group LLC

2.6.5.2 Velocity Pressure Coeff:

$K_z = 2.01 (z/z_g)^{2/\alpha}$

z=	145	(ft)
z_g=	900	(ft)
α=	9.5	
K_z=	**1.369**	

Kzmin ≤ Kz ≤ 2.01

Table 2-4

Exposure	Z_g	α	K_{zmin}	K_e
B	1200 ft	7.0	0.70	0.9
C	900 ft	9.5	0.85	1.0
D	700 ft	11.5	1.03	1.1

2.6.6.4 Topographic Factor:

Table 2-5

Topo. Category	K_t	f
2	0.43	1.25
3	0.53	2.0
4	0.72	1.5

$K_{zt} = [1+(K_e K_t/K_{h)}]^2$

$K_h = e^{(f*z/H)}$

K_{zt}=	**1**	
K_h=	1.00	
K_e=	1	(from Table 2-4)
K_t=	0	(from Table 2-5)
f=	0	(from Table 2-5)
z=	145	
H=	0	(Ht. of the crest above surrounding terrain)
K_{zt}=	1.00	
K_{iz} =	1.16	(from Sec. 2.6.8)

(If Category 1 then K_{zt} =1.0)

Category= **1**

2.6.8 Design Ice Thickness

Max Ice Thickness =	t_i =	1.00 in
Importance Factor, I_{ice} =	I_{ice}=	1.00 (from Table 2-3)
$t_{iz} = 2.0*t_i*I_{ice}*K_{iz}*(Kzt)^{0.35}$	t_{iz} =	2.32 in

Date: 8/18/2021
Project Name: NORTHFORD CT
Designed By: CL Checked By: MSC

HUDSON Design Group LLC

2.6.7 Gust Effect Factor

2.6.7.1 Self Supporting Lattice Structures

Gh = 1.0 Latticed Structures > 600 ft

Gh = 0.85 Latticed Structures 450 ft or less

Gh = 0.85 + 0.15 [h/150 - 3.0] h= ht. of structure

h=	195	Gh=	0.85

2.6.7.2 Guyed Masts Gh= 0.85

2.6.7.3 Pole Structures Gh= 1.1

2.6.9 Appurtenances Gh= 1.0

2.6.7.4 Structures Supported on Other Structures
(Cantilivered tubular or latticed spines, pole, structures on buildings (ht. : width ratio > 5)

Gh=	1.35	**Gh=**	**1.00**

2.6.9.2 Design Wind Force on Appurtenances

State Code Ultimate Design Wind Speed: V_{ult} = 130 mph

Nomial Design Wind Speed, $V_{asd} = V_{ult} \sqrt{(0.6)}$ V_{asd} = 101 mph

V_{asd} per the Connecticut State Building Code, Latest Edition.

Per TIA-222-G, V_{min} = 95 mph V_{max} = 115 mph

$F = q_z * Gh * (EPA)_A$

$q_z = 0.00256 * K_z * K_{zt} * K_d * V_{max}^2 * I$

		K_z=	1.369	
		K_{zt}=	1.0	
q_z=	**30.20**	K_d=	0.85	(from Table 2-2)
$q_{z\,(ice)}$=	**7.45**	V_{asd}=	101	mph
$q_{z\,(30)}$=	**2.68**	$V_{max\,(ice)}$=	50	mph
		V_{30}=	30	mph
		I=	1.0	(from Table 2-3)
		I_{wice}=	1.0	(from Table 2-3)

Table 2-2

Structure Type	Wind Direction Probability Factor, Kd
Latticed structures with triangular, square or rectangular cross sections	0.85
Tubular pole structures, latticed structures with other cross sections, appurtenances	0.95

Date: 8/18/2021
Project Name: NORTHFORD CT
Designed By: CL Checked By: MSC

HUDSON Design Group LLC

Determine Ca:

Table 2-8

Force Coefficients (Ca) for Appurtenances				
Member Type		Aspect Ratio ≤ 2.5	Aspect Ratio = 7	Aspect Ratio ≥ 25
		Ca	Ca	Ca
Flat		1.2	1.4	2.0
Round	C < 32 (Subcritical)	0.7	0.8	1.2
	32 ≤ C ≤ 64 (Transitional)	$3.76/(C^{0.485})$	$3.37/(C^{0.415})$	$38.4/(C^{-1.0})$
	C > 64 (Supercritical)	0.5	0.6	0.6

Aspect Ratio is the overall length/width ratio in the plane normal to the wind direction.
(Aspect ratio is independent of the spacing between support points of a linear appurtenance,

Note: Linear interpolation may be used for aspect ratios other than those shown.

Ice Thickness = 2.32 in | **Angle =** 0 (deg) | **Equivalent Angle =** 180 (deg)

Appurtenances	Height	Width	Depth	Flat Area	Aspect Ratio	Ca	Force (lbs)	Force (lbs) (w/ Ice)	Force (lbs) (30 mph)
LNX-6513DS-VTM Antenna	54.8	11.9	7.1	4.53	4.61	1.29	177	66	16
JAHH-65B-R3B Antenna	72.0	13.8	8.2	6.90	5.22	1.32	275	96	24
B5/B13 RRH-BR04C RRH	15.0	15.0	8.1	1.56	1.00	1.20	57	24	5
B5/B13 RRH-BR04C RRH (Shielde	15.0	7.5	8.1	0.78	2.00	1.20	28	15	3
B2/B66A RRH-BR049 RRH	15.0	15.0	10.0	1.56	1.00	1.20	57	24	5
B2/B66A RRH-BR049 RRH (Shiel	15.0	7.5	10.0	0.78	2.00	1.20	28	15	3
CBC78T-DS-43-2X Diplexer	9.7	6.9	6.4	0.46	1.41	1.20	17	10	1
CBC78T-DS-43-2X Diplexer (Shie	9.7	3.5	6.4	0.23	2.81	1.21	9	7	1
Junction Box	28.9	15.7	10.3	3.15	1.84	1.20	114	42	10
1-1/2" Pipe	1.9	12.0		0.16	0.16	1.20	6		
2" Pipe	2.4	12.0		0.20	0.20	1.20	7		
2-1/2" Pipe	2.9	12.0		0.24	0.24	1.20	9		
3" Pipe	3.5	12.0		0.29	0.29	1.20	11		
2x2 HSS	2.0	12.0		0.17	0.17	1.20	6		
L 2-1/2x2-1/2 Angles	2.5	12.0		0.21	0.21	1.20	8		

Date: 8/18/2021
Project Name: NORTHFORD CT
Designed By: CL Checked By: MSC

HUDSON Design Group LLC

WIND LOADS

Angle =	30	(deg)	Ice Thickness =	2.32	in.	Equivalent Angle =	210	(deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Aspect Ratio	Aspect Ratio	Ca (normal)	Ca (side)	Force (lbs) (normal)	Force (lbs) (side)	Force (lbs) (angle)
LNX-6513DS-VTM Antenna	54.8	11.9	7.1	4.53	2.70	4.61	7.72	1.29	1.42	177	116	162
JAHH-65B-R3B Antenna	72.0	13.8	8.2	6.90	4.10	5.22	8.78	1.32	1.46	275	181	252
B5/B13 RRH-BR04C RRH	15.0	15.0	8.1	1.56	0.84	1.00	1.85	1.20	1.20	57	31	50
B5/B13 RRH-BR04C RRH (Shielded	15.0	7.5	8.1	0.78	0.84	2.00	1.85	1.20	1.20	28	31	29
B2/B66A RRH-BR049 RRH	15.0	15.0	10.0	1.56	1.04	1.00	1.50	1.20	1.20	57	38	52
B2/B66A RRH-BR049 RRH (Shielde	15.0	7.5	10.0	0.78	1.04	2.00	1.50	1.20	1.20	28	38	31
CBC78T-DS-43-2X Diplexer	9.7	6.9	6.4	0.46	0.43	1.41	1.52	1.20	1.20	17	16	17
CBC78T-DS-43-2X Diplexer (Shield	9.7	3.5	6.4	0.23	0.43	2.81	1.52	1.21	1.20	9	16	10
Junction Box	28.9	15.7	10.3	3.15	2.07	1.84	2.81	1.20	1.21	114	76	105

WIND LOADS WITH ICE:

LNX-6513DS-VTM Antenna	59.4	16.5	11.7	6.83	4.85	3.59	5.06	1.25	1.31	63	47	59
JAHH-65B-R3B Antenna	76.6	18.4	12.8	9.81	6.83	4.16	5.97	1.27	1.35	93	69	87
B5/B13 RRH-BR04C RRH	19.6	19.6	12.7	2.68	1.74	1.00	1.54	1.20	1.20	24	16	22
B5/B13 RRH-BR04C RRH (Shielded	19.6	9.8	12.7	1.34	1.74	2.00	1.54	1.20	1.20	12	16	13
B2/B66A RRH-BR049 RRH	19.6	19.6	14.6	2.68	2.00	1.00	1.34	1.20	1.20	24	18	22
B2/B66A RRH-BR049 RRH (Shielde	19.6	9.8	14.6	1.34	2.00	2.00	1.34	1.20	1.20	12	18	13
CBC78T-DS-43-2X Diplexer	14.3	11.5	11.0	1.15	1.10	1.24	1.30	1.20	1.20	10	10	10
CBC78T-DS-43-2X Diplexer (Shield	14.3	5.8	11.0	0.57	1.10	2.49	1.30	1.20	1.20	5	10	6
Junction Box	33.5	20.3	14.9	4.74	3.48	1.65	2.25	1.20	1.20	42	31	40

WIND LOADS AT 30 MPH:

LNX-6513DS-VTM Antenna	54.8	11.9	7.1	4.53	2.70	4.61	7.72	1.29	1.42	16	10	14
JAHH-65B-R3B Antenna	72.0	13.8	8.2	6.90	4.10	5.22	8.78	1.32	1.46	24	16	22
B5/B13 RRH-BR04C RRH	15.0	15.0	8.1	1.56	0.84	1.00	1.85	1.20	1.20	5	3	4
B5/B13 RRH-BR04C RRH (Shielded	15.0	7.5	8.1	0.78	0.84	2.00	1.85	1.20	1.20	3	3	3
B2/B66A RRH-BR049 RRH	15.0	15.0	10.0	1.56	1.04	1.00	1.50	1.20	1.20	5	3	5
B2/B66A RRH-BR049 RRH (Shielde	15.0	7.5	10.0	0.78	1.04	2.00	1.50	1.20	1.20	3	3	3
CBC78T-DS-43-2X Diplexer	9.7	6.9	6.4	0.46	0.43	1.41	1.52	1.20	1.20	1	1	1
CBC78T-DS-43-2X Diplexer (Shield	9.7	3.5	6.4	0.23	0.43	2.81	1.52	1.21	1.20	1	1	1
Junction Box	28.9	15.7	10.3	3.15	2.07	1.84	2.81	1.20	1.21	10	7	9

Date: 8/18/2021
Project Name: NORTHFORD CT
Designed By: CL Checked By: MSC

HUDSON Design Group LLC

WIND LOADS

Angle =	60	(deg)	Ice Thickness =	2.32	in.	Equivalent Angle =	240	(deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Ratio (normal)	Ratio (side)	Ca (normal)	Ca (side)	Force (lbs) (normal)	Force (lbs) (side)	Force (lbs) (angle)
LNX-6513DS-VTM Antenna	54.8	11.9	7.1	4.53	2.70	4.61	7.72	1.29	1.42	177	116	131
JAHH-65B-R3B Antenna	72.0	13.8	8.2	6.90	4.10	5.22	8.78	1.32	1.46	275	181	204
B5/B13 RRH-BR04C RRH	15.0	15.0	8.1	1.56	0.84	1.00	1.85	1.20	1.20	57	31	37
B5/B13 RRH-BR04C RRH (Shielded	15.0	11.3	8.1	1.17	0.84	1.33	1.85	1.20	1.20	42	31	34
B2/B66A RRH-BR049 RRH	15.0	15.0	10.0	1.56	1.04	1.00	1.50	1.20	1.20	57	38	42
B2/B66A RRH-BR049 RRH (Shielde	15.0	11.3	10.0	1.17	1.04	1.33	1.50	1.20	1.20	42	38	39
CBC78T-DS-43-2X Diplexer	9.7	6.9	6.4	0.46	0.43	1.41	1.52	1.20	1.20	17	16	16
CBC78T-DS-43-2X Diplexer (Shield	9.7	5.2	6.4	0.35	0.43	1.87	1.52	1.20	1.20	13	16	15
Junction Box	28.9	15.7	10.3	3.15	2.07	1.84	2.81	1.20	1.21	114	76	85

WIND LOADS WITH ICE:

LNX-6513DS-VTM Antenna	59.4	16.5	11.7	6.83	4.85	3.59	5.06	1.25	1.31	63	47	51
JAHH-65B-R3B Antenna	76.6	18.4	12.8	9.81	6.83	4.16	5.97	1.27	1.35	93	69	75
B5/B13 RRH-BR04C RRH	19.6	19.6	12.7	2.68	1.74	1.00	1.54	1.20	1.20	24	16	18
B5/B13 RRH-BR04C RRH (Shielded	19.6	14.7	12.7	2.01	1.74	1.33	1.54	1.20	1.20	18	16	16
B2/B66A RRH-BR049 RRH	19.6	19.6	14.6	2.68	2.00	1.00	1.34	1.20	1.20	24	18	19
B2/B66A RRH-BR049 RRH (Shielde	19.6	14.7	14.6	2.01	2.00	1.33	1.34	1.20	1.20	18	18	18
CBC78T-DS-43-2X Diplexer	14.3	11.5	11.0	1.15	1.10	1.24	1.30	1.20	1.20	10	10	10
CBC78T-DS-43-2X Diplexer (Shield	14.3	8.7	11.0	0.86	1.10	1.66	1.30	1.20	1.20	8	10	9
Junction Box	33.5	20.3	14.9	4.74	3.48	1.65	2.25	1.20	1.20	42	31	34

WIND LOADS AT 30 MPH:

LNX-6513DS-VTM Antenna	54.8	11.9	7.1	4.53	2.70	4.61	7.72	1.29	1.42	16	10	12
JAHH-65B-R3B Antenna	72.0	13.8	8.2	6.90	4.10	5.22	8.78	1.32	1.46	24	16	18
B5/B13 RRH-BR04C RRH	15.0	15.0	8.1	1.56	0.84	1.00	1.85	1.20	1.20	5	3	3
B5/B13 RRH-BR04C RRH (Shielded	15.0	11.3	8.1	1.17	0.84	1.33	1.85	1.20	1.20	4	3	3
B2/B66A RRH-BR049 RRH	15.0	15.0	10.0	1.56	1.04	1.00	1.50	1.20	1.20	5	3	4
B2/B66A RRH-BR049 RRH (Shielde	15.0	11.3	10.0	1.17	1.04	1.33	1.50	1.20	1.20	4	3	3
CBC78T-DS-43-2X Diplexer	9.7	6.9	6.4	0.46	0.43	1.41	1.52	1.20	1.20	1	1	1
CBC78T-DS-43-2X Diplexer (Shield	9.7	5.2	6.4	0.35	0.43	1.87	1.52	1.20	1.20	1	1	1
Junction Box	28.9	15.7	10.3	3.15	2.07	1.84	2.81	1.20	1.21	10	7	8

Date: 8/18/2021
Project Name: NORTHFORD CT
Designed By: CL Checked By: MSC

HUDSON Design Group LLC

WIND LOADS

Angle =	90	(deg)	Ice Thickness =	2.32	in.	Equivalent Angle =	270	(deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Ratio (normal)	Ratio (side)	Ca (normal)	Ca (side)	Force (lbs) (normal)	Force (lbs) (side)	Force (lbs) (angle)
LNX-6513DS-VTM Antenna	54.8	11.9	7.1	4.53	2.70	4.61	7.72	1.29	1.42	177	116	116
JAHH-65B-R3B Antenna	72.0	13.8	8.2	6.90	4.10	5.22	8.78	1.32	1.46	275	181	181
B5/B13 RRH-BR04C RRH	15.0	15.0	8.1	1.56	0.84	1.00	1.85	1.20	1.20	57	31	31
B5/B13 RRH-BR04C RRH (Shielded	15.0	7.5	8.1	0.78	0.84	2.00	1.85	1.20	1.20	28	31	31
B2/B66A RRH-BR049 RRH	15.0	15.0	10.0	1.56	1.04	1.00	1.50	1.20	1.20	57	38	38
B2/B66A RRH-BR049 RRH (Shielde	15.0	7.5	10.0	0.78	1.04	2.00	1.50	1.20	1.20	28	38	38
CBC78T-DS-43-2X Diplexer	9.7	6.9	6.4	0.46	0.43	1.41	1.52	1.20	1.20	17	16	16
CBC78T-DS-43-2X Diplexer (Shielde	9.7	3.5	6.4	0.23	0.43	2.81	1.52	1.21	1.20	9	16	16
Junction Box	28.9	15.7	10.3	3.15	2.07	1.84	2.81	1.20	1.21	114	76	76

WIND LOADS WITH ICE:

LNX-6513DS-VTM Antenna	59.4	16.5	11.7	6.83	4.85	3.59	5.06	1.25	1.31	63	47	47
JAHH-65B-R3B Antenna	76.6	18.4	12.8	9.81	6.83	4.16	5.97	1.27	1.35	93	69	69
B5/B13 RRH-BR04C RRH	19.6	19.6	12.7	2.68	1.74	1.00	1.54	1.20	1.20	24	16	16
B5/B13 RRH-BR04C RRH (Shielded	19.6	12.1	12.7	1.66	1.74	1.62	1.54	1.20	1.20	15	16	16
B2/B66A RRH-BR049 RRH	19.6	19.6	14.6	2.68	2.00	1.00	1.34	1.20	1.20	24	18	18
B2/B66A RRH-BR049 RRH (Shielde	19.6	12.1	14.6	1.66	2.00	1.62	1.34	1.20	1.20	15	18	18
CBC78T-DS-43-2X Diplexer	14.3	11.5	11.0	1.15	1.10	1.24	1.30	1.20	1.20	10	10	10
CBC78T-DS-43-2X Diplexer (Shielde	14.3	8.1	11.0	0.81	1.10	1.77	1.30	1.20	1.20	7	10	10
Junction Box	33.5	20.3	14.9	4.74	3.48	1.65	2.25	1.20	1.20	42	31	31

WIND LOADS AT 30 MPH:

LNX-6513DS-VTM Antenna	54.8	11.9	7.1	4.53	2.70	4.61	7.72	1.29	1.42	16	10	10
JAHH-65B-R3B Antenna	72.0	13.8	8.2	6.90	4.10	5.22	8.78	1.32	1.46	24	16	16
B5/B13 RRH-BR04C RRH	15.0	15.0	8.1	1.56	0.84	1.00	1.85	1.20	1.20	5	3	3
B5/B13 RRH-BR04C RRH (Shielded	15.0	7.5	8.1	0.78	0.84	2.00	1.85	1.20	1.20	3	3	3
B2/B66A RRH-BR049 RRH	15.0	15.0	10.0	1.56	1.04	1.00	1.50	1.20	1.20	5	3	3
B2/B66A RRH-BR049 RRH (Shielde	15.0	7.5	10.0	0.78	1.04	2.00	1.50	1.20	1.20	3	3	3
CBC78T-DS-43-2X Diplexer	9.7	6.9	6.4	0.46	0.43	1.41	1.52	1.20	1.20	1	1	1
CBC78T-DS-43-2X Diplexer (Shielde	9.7	3.5	6.4	0.23	0.43	2.81	1.52	1.21	1.20	1	1	1
Junction Box	28.9	15.7	10.3	3.15	2.07	1.84	2.81	1.20	1.21	10	7	7

Date: 8/18/2021
Project Name: NORTHFORD CT
Designed By: CL Checked By: MSC

HUDSON Design Group LLC

WIND LOADS

Angle =	120	(deg)	Ice Thickness =	2.32	in.	Equivalent Angle =	300	(deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Ratio (normal)	Ratio (side)	Ca (normal)	Ca (side)	Force (lbs) (normal)	Force (lbs) (side)	Force (lbs) (angle)
LNX-6513DS-VTM Antenna	54.8	11.9	7.1	4.53	2.70	4.61	7.72	1.29	1.42	177	116	131
JAHH-65B-R3B Antenna	72.0	13.8	8.2	6.90	4.10	5.22	8.78	1.32	1.46	275	181	204
B5/B13 RRH-BR04C RRH	15.0	15.0	8.1	1.56	0.84	1.00	1.85	1.20	1.20	57	31	37
B5/B13 RRH-BR04C RRH (Shielded	15.0	11.3	8.1	1.17	0.84	1.33	1.85	1.20	1.20	42	31	34
B2/B66A RRH-BR049 RRH	15.0	15.0	10.0	1.56	1.04	1.00	1.50	1.20	1.20	57	38	42
B2/B66A RRH-BR049 RRH (Shielde	15.0	11.3	10.0	1.17	1.04	1.33	1.50	1.20	1.20	42	38	39
CBC78T-DS-43-2X Diplexer	9.7	6.9	6.4	0.46	0.43	1.41	1.52	1.20	1.20	17	16	16
CBC78T-DS-43-2X Diplexer (Shield	9.7	5.2	6.4	0.35	0.43	1.87	1.52	1.20	1.20	13	16	15
Junction Box	28.9	15.7	10.3	3.15	2.07	1.84	2.81	1.20	1.21	114	76	85

WIND LOADS WITH ICE:

LNX-6513DS-VTM Antenna	59.4	16.5	11.7	6.83	4.85	3.59	5.06	1.25	1.31	63	47	51
JAHH-65B-R3B Antenna	76.6	18.4	12.8	9.81	6.83	4.16	5.97	1.27	1.35	93	69	75
B5/B13 RRH-BR04C RRH	19.6	19.6	12.7	2.68	1.74	1.00	1.54	1.20	1.20	24	16	18
B5/B13 RRH-BR04C RRH (Shielded	19.6	14.7	12.7	2.01	1.74	1.33	1.54	1.20	1.20	18	16	16
B2/B66A RRH-BR049 RRH	19.6	19.6	14.6	2.68	2.00	1.00	1.34	1.20	1.20	24	18	19
B2/B66A RRH-BR049 RRH (Shielde	19.6	14.7	14.6	2.01	2.00	1.33	1.34	1.20	1.20	18	18	18
CBC78T-DS-43-2X Diplexer	14.3	11.5	11.0	1.15	1.10	1.24	1.30	1.20	1.20	10	10	10
CBC78T-DS-43-2X Diplexer (Shield	14.3	8.7	11.0	0.86	1.10	1.66	1.30	1.20	1.20	8	10	9
Junction Box	33.5	20.3	14.9	4.74	3.48	1.65	2.25	1.20	1.20	42	31	34

WIND LOADS AT 30 MPH:

LNX-6513DS-VTM Antenna	54.8	11.9	7.1	4.53	2.70	4.61	7.72	1.29	1.42	16	10	12
JAHH-65B-R3B Antenna	72.0	13.8	8.2	6.90	4.10	5.22	8.78	1.32	1.46	24	16	18
B5/B13 RRH-BR04C RRH	15.0	15.0	8.1	1.56	0.84	1.00	1.85	1.20	1.20	5	3	3
B5/B13 RRH-BR04C RRH (Shielded	15.0	11.3	8.1	1.17	0.84	1.33	1.85	1.20	1.20	4	3	3
B2/B66A RRH-BR049 RRH	15.0	15.0	10.0	1.56	1.04	1.00	1.50	1.20	1.20	5	3	4
B2/B66A RRH-BR049 RRH (Shielde	15.0	11.3	10.0	1.17	1.04	1.33	1.50	1.20	1.20	4	3	3
CBC78T-DS-43-2X Diplexer	9.7	6.9	6.4	0.46	0.43	1.41	1.52	1.20	1.20	1	1	1
CBC78T-DS-43-2X Diplexer (Shield	9.7	5.2	6.4	0.35	0.43	1.87	1.52	1.20	1.20	1	1	1
Junction Box	28.9	15.7	10.3	3.15	2.07	1.84	2.81	1.20	1.21	10	7	8

Date: 8/18/2021
Project Name: NORTHFORD CT
Designed By: CL Checked By: MSC

HUDSON Design Group LLC

WIND LOADS

Angle =	150	(deg)	Ice Thickness =	2.32	in.	Equivalent Angle =	330	(deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Ratio (normal)	Ratio (side)	Ca (normal)	Ca (side)	Force (lbs) (normal)	Force (lbs) (side)	Force (lbs) (angle)
LNX-6513DS-VTM Antenna	54.8	11.9	7.1	4.53	2.70	4.61	7.72	1.29	1.42	177	116	162
JAHH-65B-R3B Antenna	72.0	13.8	8.2	6.90	4.10	5.22	8.78	1.32	1.46	275	181	252
B5/B13 RRH-BR04C RRH	15.0	15.0	8.1	1.56	0.84	1.00	1.85	1.20	1.20	57	31	50
B5/B13 RRH-BR04C RRH (Shielded	15.0	7.5	8.1	0.78	0.84	2.00	1.85	1.20	1.20	28	31	29
B2/B66A RRH-BR049 RRH	15.0	15.0	10.0	1.56	1.04	1.00	1.50	1.20	1.20	57	38	52
B2/B66A RRH-BR049 RRH (Shielde	15.0	7.5	10.0	0.78	1.04	2.00	1.50	1.20	1.20	28	38	31
CBC78T-DS-43-2X Diplexer	9.7	6.9	6.4	0.46	0.43	1.41	1.52	1.20	1.20	17	16	17
CBC78T-DS-43-2X Diplexer (Shield	9.7	3.5	6.4	0.23	0.43	2.81	1.52	1.21	1.20	9	16	10
Junction Box	28.9	15.7	10.3	3.15	2.07	1.84	2.81	1.20	1.21	114	76	105

WIND LOADS WITH ICE:

LNX-6513DS-VTM Antenna	59.4	16.5	11.7	6.83	4.85	3.59	5.06	1.25	1.31	63	47	59
JAHH-65B-R3B Antenna	76.6	18.4	12.8	9.81	6.83	4.16	5.97	1.27	1.35	93	69	87
B5/B13 RRH-BR04C RRH	19.6	19.6	12.7	2.68	1.74	1.00	1.54	1.20	1.20	24	16	22
B5/B13 RRH-BR04C RRH (Shielded	19.6	9.8	12.7	1.34	1.74	2.00	1.54	1.20	1.20	12	16	13
B2/B66A RRH-BR049 RRH	19.6	19.6	14.6	2.68	2.00	1.00	1.34	1.20	1.20	24	18	22
B2/B66A RRH-BR049 RRH (Shielde	19.6	9.8	14.6	1.34	2.00	2.00	1.34	1.20	1.20	12	18	13
CBC78T-DS-43-2X Diplexer	14.3	11.5	11.0	1.15	1.10	1.24	1.30	1.20	1.20	10	10	10
CBC78T-DS-43-2X Diplexer (Shield	14.3	5.8	11.0	0.57	1.10	2.49	1.30	1.20	1.20	5	10	6
Junction Box	33.5	20.3	14.9	4.74	3.48	1.65	2.25	1.20	1.20	42	31	40

WIND LOADS AT 30 MPH:

LNX-6513DS-VTM Antenna	54.8	11.9	7.1	4.53	2.70	4.61	7.72	1.29	1.42	16	10	14
JAHH-65B-R3B Antenna	72.0	13.8	8.2	6.90	4.10	5.22	8.78	1.32	1.46	24	16	22
B5/B13 RRH-BR04C RRH	15.0	15.0	8.1	1.56	0.84	1.00	1.85	1.20	1.20	5	3	4
B5/B13 RRH-BR04C RRH (Shielded	15.0	7.5	8.1	0.78	0.84	2.00	1.85	1.20	1.20	3	3	3
B2/B66A RRH-BR049 RRH	15.0	15.0	10.0	1.56	1.04	1.00	1.50	1.20	1.20	5	3	5
B2/B66A RRH-BR049 RRH (Shielde	15.0	7.5	10.0	0.78	1.04	2.00	1.50	1.20	1.20	3	3	3
CBC78T-DS-43-2X Diplexer	9.7	6.9	6.4	0.46	0.43	1.41	1.52	1.20	1.20	1	1	1
CBC78T-DS-43-2X Diplexer (Shield	9.7	3.5	6.4	0.23	0.43	2.81	1.52	1.21	1.20	1	1	1
Junction Box	28.9	15.7	10.3	3.15	2.07	1.84	2.81	1.20	1.21	10	7	9

Date: 8/18/2021
Project Name: NORTHFORD CT
Designed By: CL **Checked By:** MSC

HUDSON Design Group LLC

ICE WEIGHT CALCULATIONS

Thickness of ice: 2.32 in.
Density of ice: 56 pcf

LNX-6513DS-VTM Antenna

Weight of ice based on total radial SF area:

Height (in):	54.8	
Width (in):	11.9	
Depth (in):	7.1	
Total weight of ice on object:		209 lbs
Weight of object:	33.0 lbs	
Combined weight of ice and object:		242 lbs

JAHH-65B-R3B Antenna

Weight of ice based on total radial SF area:

Height (in):	72.0	
Width (in):	13.8	
Depth (in):	8.2	
Total weight of ice on object:		312 lbs
Weight of object:	64.0 lbs	
Combined weight of ice and object:		376 lbs

B5/B13 RRH-BR04C RRH

Weight of ice based on total radial SF area:

Height (in):	15.0	
Width (in):	15.0	
Depth (in):	8.1	
Total weight of ice on object:		69 lbs
Weight of object:	82.0 lbs	
Combined weight of ice and object:		151 lbs

B2/B66A RRH-BR049 RRH

Weight of ice based on total radial SF area:

Height (in):	15.0	
Width (in):	15.0	
Depth (in):	10.0	
Total weight of ice on object:		72 lbs
Weight of object:	98.0 lbs	
Combined weight of ice and object:		170 lbs

CBC78T-DS-43-2X Diplexer

Weight of ice based on total radial SF area:

Height (in):	9.7	
Width (in):	6.9	
Depth (in):	6.4	
Total weight of ice on object:		27 lbs
Weight of object:	21.0 lbs	
Combined weight of ice and object:		48 lbs

Junction Box

Weight of ice based on total radial SF area:

Height (in):	28.9	
Width (in):	15.7	
Depth (in):	10.3	
Total weight of ice on object:		144 lbs
Weight of object:	32.0 lbs	
Combined weight of ice and object:		176 lbs

1-1/2" Pipe

Per foot weight of ice:

diameter (in):	1.9	
Per foot weight of ice on object:		12 plf

2" Pipe

Per foot weight of ice:

diameter (in):	2.38	
Per foot weight of ice on object:		13 plf

2-1/2" Pipe

Per foot weight of ice:

diameter (in):	2.88	
Per foot weight of ice on object:		15 plf

3" Pipe

Per foot weight of ice:

diameter (in):	3.5	
Per foot weight of ice on object:		16 plf

2x2 HSS

Weight of ice based on total radial SF area:

Height (in):	2	
Width (in):	2	
Per foot weight of ice on object:		15 plf

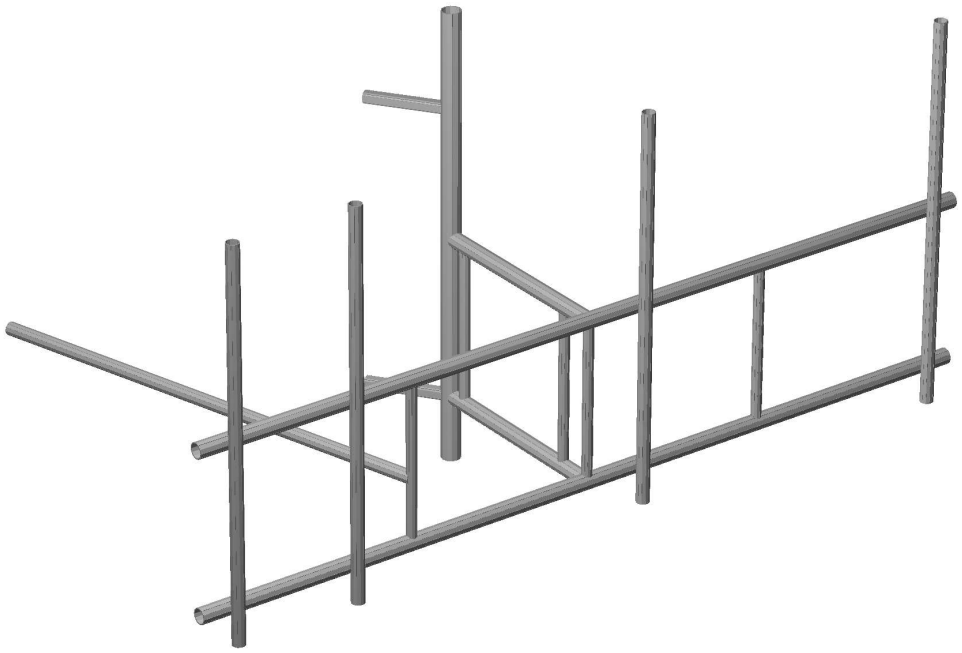
L 2-1/2x2-1/2 Angles

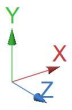
Weight of ice based on total radial SF area:

Height (in):	2.5	
Width (in):	2.5	
Per foot weight of ice on object:		17 plf

HUDSON
Design Group LLC

Mount Calculations
(Existing Conditions)

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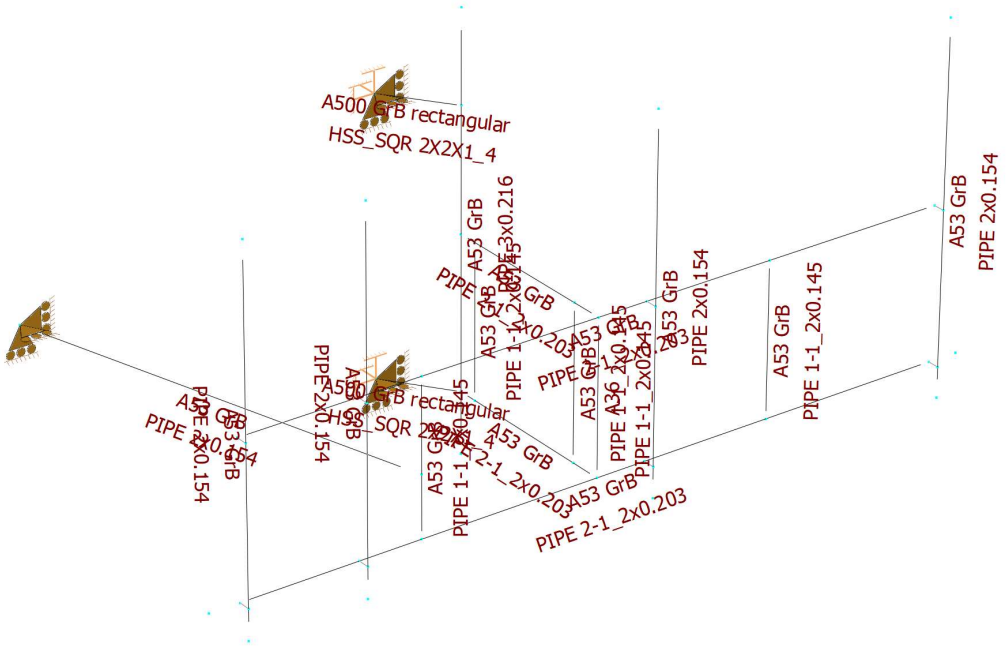
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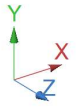
HSS_SQR 2X2X1_4
A53 GrB
PIPE 2x0.154
PIPE 1-1_2x0.145
PIPE 2-1_2x0.203
PIPE 1-1_2x0.216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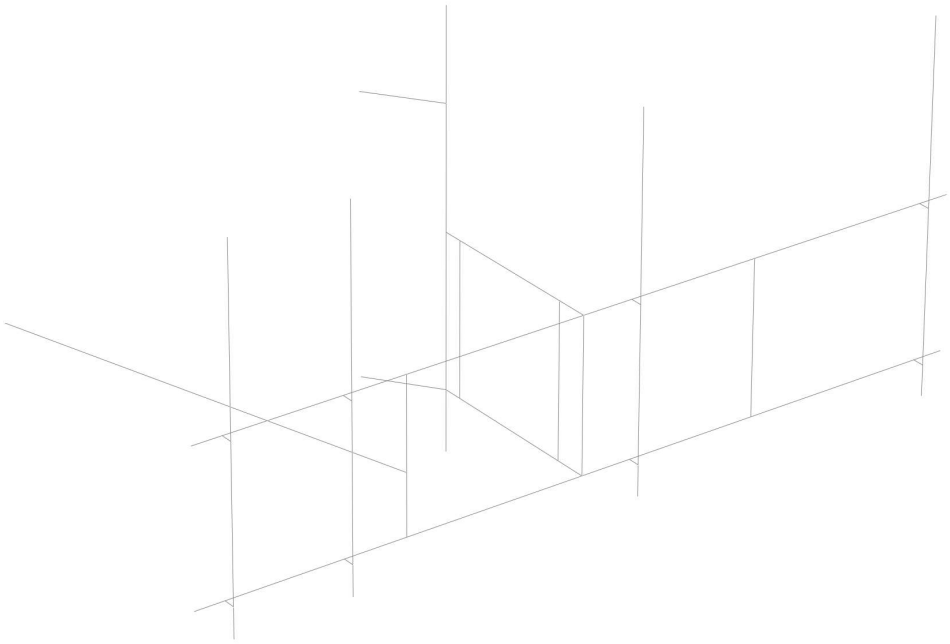
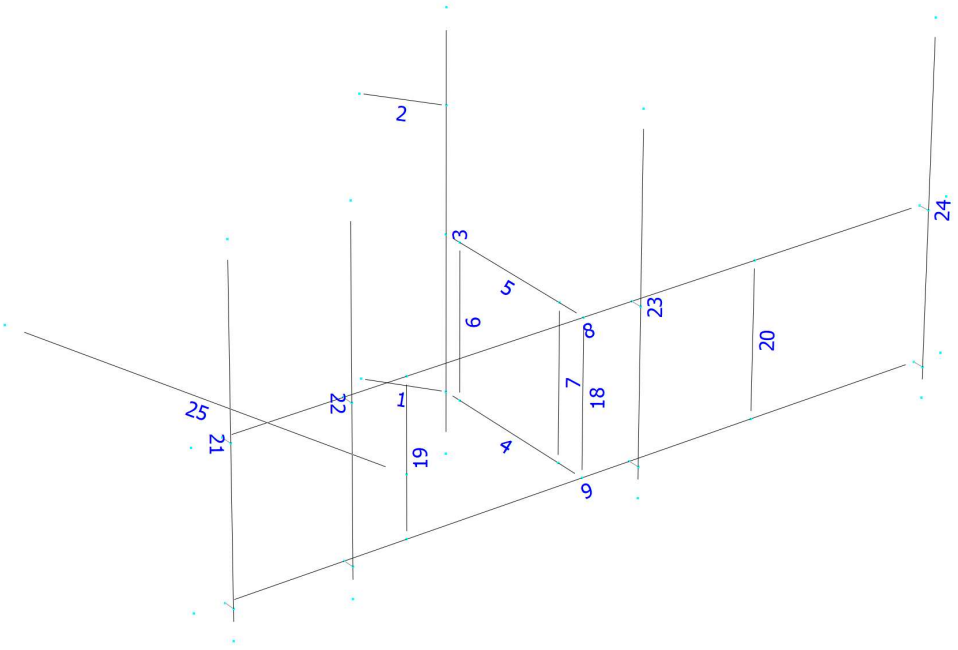
X
Z

Design status
- Not designed
- Error on design
- Design O.K.
- With warnings

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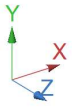
Y
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Load data

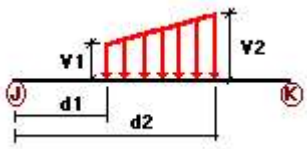
GLOSSARY

Comb : Indicates if load condition is a load combination

Load Conditions

Condition	Description	Comb.	Category
DL	Dead Load	No	DL
Wo	Wind Load (No Ice)	No	WIND
Di	Ice Load	No	LL
Wi	Wind Load (With Ice)	No	WIND

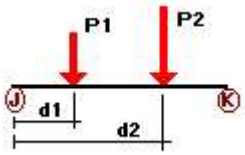
Distributed force on members



Condition	Member	Dir1	Val1 [Kip/ft]	Val2 [Kip/ft]	Dist1 [ft]	%	Dist2 [ft]	%
Wo	3	z	-0.011	-0.011	0.00	No	100.00	Yes
	6	z	-0.006	-0.006	0.00	No	100.00	Yes
	7	z	-0.006	-0.006	0.00	No	100.00	Yes
	8	z	-0.009	-0.009	0.00	No	100.00	Yes
	9	z	-0.009	-0.009	0.00	No	100.00	Yes
	18	z	-0.006	-0.006	0.00	No	100.00	Yes
	19	z	-0.006	-0.006	0.00	No	100.00	Yes
	20	z	-0.006	-0.006	0.00	No	100.00	Yes
	21	z	-0.007	-0.007	0.00	No	100.00	Yes
	23	z	-0.007	-0.007	0.00	No	100.00	Yes
	25	z	-0.007	-0.007	0.00	No	100.00	Yes
Di	1	y	-0.015	-0.015	0.00	No	100.00	Yes
	2	y	-0.015	-0.015	0.00	No	100.00	Yes
	3	y	-0.016	-0.016	0.00	No	100.00	Yes
	4	y	-0.015	-0.015	0.00	No	100.00	Yes
	5	y	-0.015	-0.015	0.00	No	100.00	Yes
	6	y	-0.012	-0.012	0.00	No	100.00	Yes
	7	y	-0.012	-0.012	0.00	No	100.00	Yes
	8	y	-0.015	-0.015	0.00	No	100.00	Yes
	9	y	-0.015	-0.015	0.00	No	100.00	Yes
	18	y	-0.012	-0.012	0.00	No	100.00	Yes
	19	y	-0.012	-0.012	0.00	No	100.00	Yes
	20	y	-0.012	-0.012	0.00	No	100.00	Yes
	21	y	-0.013	-0.013	0.00	No	100.00	Yes

22	y	-0.013	-0.013	0.00	No	100.00	Yes
23	y	-0.013	-0.013	0.00	No	100.00	Yes
24	y	-0.013	-0.013	0.00	No	100.00	Yes
25	y	-0.013	-0.013	0.00	No	100.00	Yes

Concentrated forces on members



Condition	Member	Dir1	Value1 [Kip]	Dist1 [ft]	%
DL	22	y	-0.114	0.50	No
		y	-0.114	5.00	No
		y	-0.098	2.00	No
		y	-0.021	3.50	No
	24	y	-0.017	1.00	No
		y	-0.017	5.00	No
		y	-0.082	2.50	No
Wo	22	z	-0.275	0.50	No
		z	-0.275	5.00	No
		z	-0.028	2.00	No
		z	-0.009	3.50	No
	24	z	-0.089	1.00	No
		z	-0.089	5.00	No
		z	-0.028	2.50	No
Di	22	y	-0.312	0.50	No
		y	-0.312	5.00	No
		y	-0.072	2.00	No
		y	-0.027	3.50	No
	24	y	-0.105	1.00	No
		y	-0.105	5.00	No
		y	-0.069	2.50	No
Wi	22	z	-0.096	0.50	No
		z	-0.096	5.00	No
		z	-0.015	2.00	No
		z	-0.007	3.50	No
	24	z	-0.033	1.00	No
		z	-0.033	5.00	No
		z	-0.015	2.50	No

Self weight multipliers for load conditions

Condition	Description	Self weight multiplier			
		Comb.	MultX	MultY	MultZ
DL	Dead Load	No	0.00	-1.00	0.00
Wo	Wind Load (No Ice)	No	0.00	0.00	0.00
Di	Ice Load	No	0.00	0.00	0.00
Wi	Wind Load (With Ice)	No	0.00	0.00	0.00

Earthquake (Dynamic analysis only)

Condition	a/g	Ang. [Deg]	Damp. [%]
DL	0.00	0.00	0.00
Wo	0.00	0.00	0.00
Di	0.00	0.00	0.00
Wi	0.00	0.00	0.00

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Steel Code Check

Report: Summary - Group by member

Load conditions to be included in design :

LC1=1.2DL+1.6Wo
LC2=0.9DL+1.6Wo
LC3=1.2DL+Di+Wi
LC4=1.2DL
LC5=0.9DL

Description	Section	Member	Ctrl Eq.	Ratio	Status	Reference
	HSS_SQR 2X2X1_4	**1**	LC3 at 0.00%	0.90	OK	Eq. H1-1b
		2	LC3 at 0.00%	**1.01**	**N.G.**	Eq. H1-1b
	PIPE 1-1_2x0.145	**6**	LC3 at 100.00%	0.53	OK	Eq. H1-1b
		7	LC3 at 100.00%	0.95	OK	Eq. H1-1b
		18	LC3 at 100.00%	0.81	OK	Eq. H1-1b
		19	LC3 at 0.00%	**1.17**	**N.G.**	Eq. H1-1b
		20	LC3 at 100.00%	0.66	OK	Eq. H1-1b
	PIPE 2-1_2x0.203	**4**	LC3 at 10.42%	0.84	OK	Eq. H3-6
		5	LC3 at 0.00%	**1.60**	**N.G.**	Eq. H3-6
		8	LC1 at 49.22%	0.96	OK	Eq. H1-1b
		9	LC3 at 49.22%	1.01	N.G.	Eq. H1-1b
	PIPE 2x0.154	**21**	LC3 at 8.33%	0.32	OK	Eq. H1-1b
		22	LC1 at 47.92%	**1.25**	**N.G.**	Eq. H1-1b
		23	LC3 at 50.00%	0.27	OK	Eq. H1-1b
		24	LC3 at 50.00%	0.44	OK	Eq. H1-1b
		25	LC1 at 100.00%	0.51	OK	Eq. H1-1b
	PIPE 3x0.216	**3**	LC3 at 50.00%	**1.02**	**N.G.**	Eq. H1-1b

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Geometry data

GLOSSARY

Cb22, Cb33	: Moment gradient coefficients
Cm22, Cm33	: Coefficients applied to bending term in interaction formula
d0	: Tapered member section depth at J end of member
DJX	: Rigid end offset distance measured from J node in axis X
DJY	: Rigid end offset distance measured from J node in axis Y
DJZ	: Rigid end offset distance measured from J node in axis Z
DKX	: Rigid end offset distance measured from K node in axis X
DKY	: Rigid end offset distance measured from K node in axis Y
DKZ	: Rigid end offset distance measured from K node in axis Z
dL	: Tapered member section depth at K end of member
Ig factor	: Inertia reduction factor (Effective Inertia/Gross Inertia) for reinforced concrete members
K22	: Effective length factor about axis 2
K33	: Effective length factor about axis 3
L22	: Member length for calculation of axial capacity
L33	: Member length for calculation of axial capacity
LB pos	: Lateral unbraced length of the compression flange in the positive side of local axis 2
LB neg	: Lateral unbraced length of the compression flange in the negative side of local axis 2
RX	: Rotation about X
RY	: Rotation about Y
RZ	: Rotation about Z
TO	: 1 = Tension only member 0 = Normal member
TX	: Translation in X
TY	: Translation in Y
TZ	: Translation in Z

Nodes

Node	X [ft]	Y [ft]	Z [ft]	Rigid Floor
1	0.00	0.00	0.00	0
2	6.50	0.00	0.00	0
3	-6.50	0.00	0.00	0
4	-0.75	0.00	-4.25	0
5	0.00	0.00	-3.21	0
6	0.00	0.00	-2.88	0
7	0.00	0.00	-0.55	0
8	0.00	2.50	0.00	0
9	6.50	2.50	0.00	0
10	-6.50	2.50	0.00	0
12	0.00	2.50	-3.21	0
13	0.00	2.50	-2.88	0
14	0.00	2.50	-0.55	0
15	-0.75	4.50	-4.25	0
16	0.00	4.50	-3.21	0
17	0.00	6.00	-3.21	0
18	0.00	-1.00	-3.21	0
19	-6.00	0.00	0.00	0
20	-6.00	2.50	0.00	0
21	6.00	0.00	0.00	0
22	6.00	2.50	0.00	0

23	0.833	0.00	0.00	0
24	0.833	2.50	0.00	0
25	-4.042	0.00	0.00	0
26	-4.042	2.50	0.00	0
27	6.00	0.00	0.20	0
28	6.00	2.50	0.20	0
29	0.833	0.00	0.20	0
30	0.833	2.50	0.20	0
31	-4.042	0.00	0.20	0
32	-4.042	2.50	0.20	0
33	-6.00	0.00	0.20	0
34	-6.00	2.50	0.20	0
35	3.00	2.50	0.00	0
36	3.00	0.00	0.00	0
37	-3.00	2.50	0.00	0
38	-3.00	0.00	0.00	0
39	0.833	-0.50	0.20	0
40	-4.042	-0.50	0.20	0
41	-6.00	-0.50	0.20	0
42	6.00	-0.50	0.20	0
43	-6.00	5.50	0.20	0
44	-4.042	5.50	0.20	0
45	0.833	5.50	0.20	0
46	6.00	5.50	0.20	0
47	-3.00	1.00	0.00	0
48	-5.00	1.00	-7.00	0

Restraints

Node	TX	TY	TZ	RX	RY	RZ
4	1	1	1	1	1	1
15	1	1	1	1	1	1
48	1	1	1	0	0	0

Members

Member	NJ	NK	Description	Section	Material	d0 [in]	dL [in]	lg factor
1	4	5		HSS_SQR 2X2X1_4	A500 GrB rectangular	0.00	0.00	0.00
2	15	16		HSS_SQR 2X2X1_4	A500 GrB rectangular	0.00	0.00	0.00
3	18	17		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
4	5	1		PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
5	12	8		PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
6	13	6		PIPE 1-1_2x0.145	A53 GrB	0.00	0.00	0.00
7	14	7		PIPE 1-1_2x0.145	A53 GrB	0.00	0.00	0.00
8	10	9		PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
9	3	2		PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
18	8	1		PIPE 1-1_2x0.145	A36	0.00	0.00	0.00
19	37	38		PIPE 1-1_2x0.145	A53 GrB	0.00	0.00	0.00
20	35	36		PIPE 1-1_2x0.145	A53 GrB	0.00	0.00	0.00
21	41	43		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00

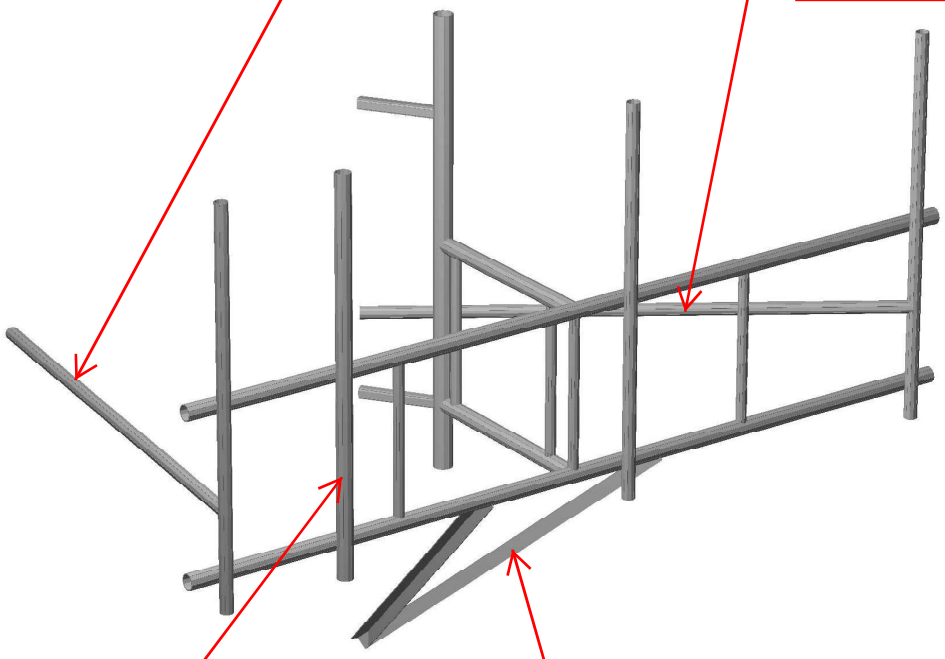
22	44	40		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
23	45	39		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
24	46	42		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
25	48	47		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00

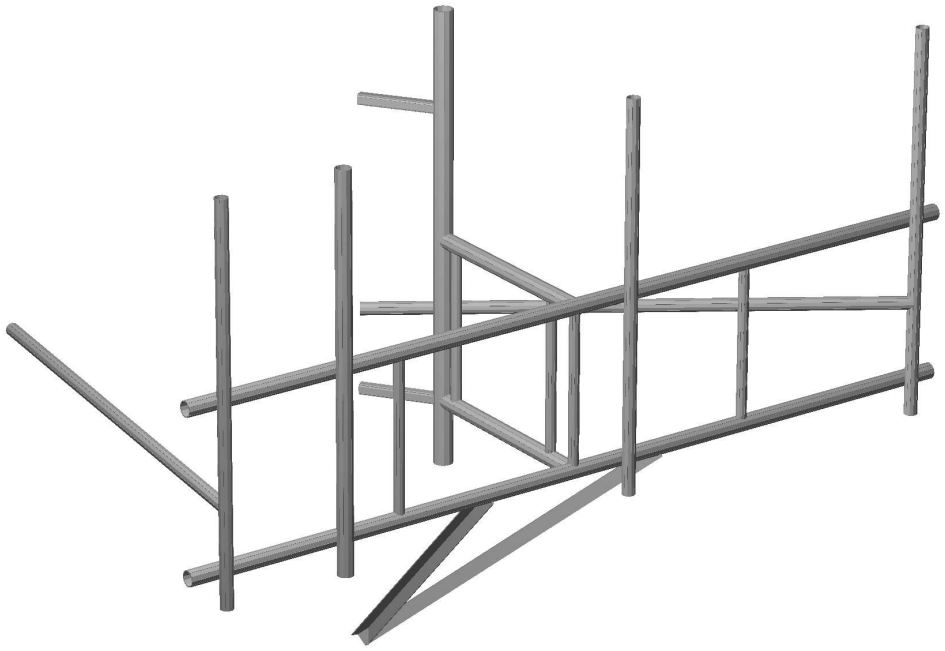
Orientation of local axes

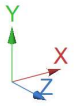
Member	Rotation [Deg]	Axes23	NX	NY	NZ
21	315.00	0	0.00	0.00	0.00
22	315.00	0	0.00	0.00	0.00
23	315.00	0	0.00	0.00	0.00
24	315.00	0	0.00	0.00	0.00

HUDSON
Design Group LLC

Mount Calculations
(Modified Conditions)


Relocate existing 2" std. (2.38" O.D.) pipe brace; secure to pipe mast at antenna position 4 and adjacent tower leg (typ. of 1 per sector, total of 3).
Proposed 2" std. (2.38" O.D.) pipe brace secured to the mount and adjacent tower leg (typ. of 1 per sector, total of 3).
Proposed sector frame stabilizer, SitePro1 P/N SFS-V-L (or approved equal), secured to existing horizontal face pipe and adjacent tower leg (typ. of 1 per sector, total of 3).
Proposed 2-1/2" std. (2.88" O.D.) pipe mast behind new JAHH-65B-R3B antennas secured to the existing mount face (typ. of 1 per sector, total of 3).
Y
X
Z

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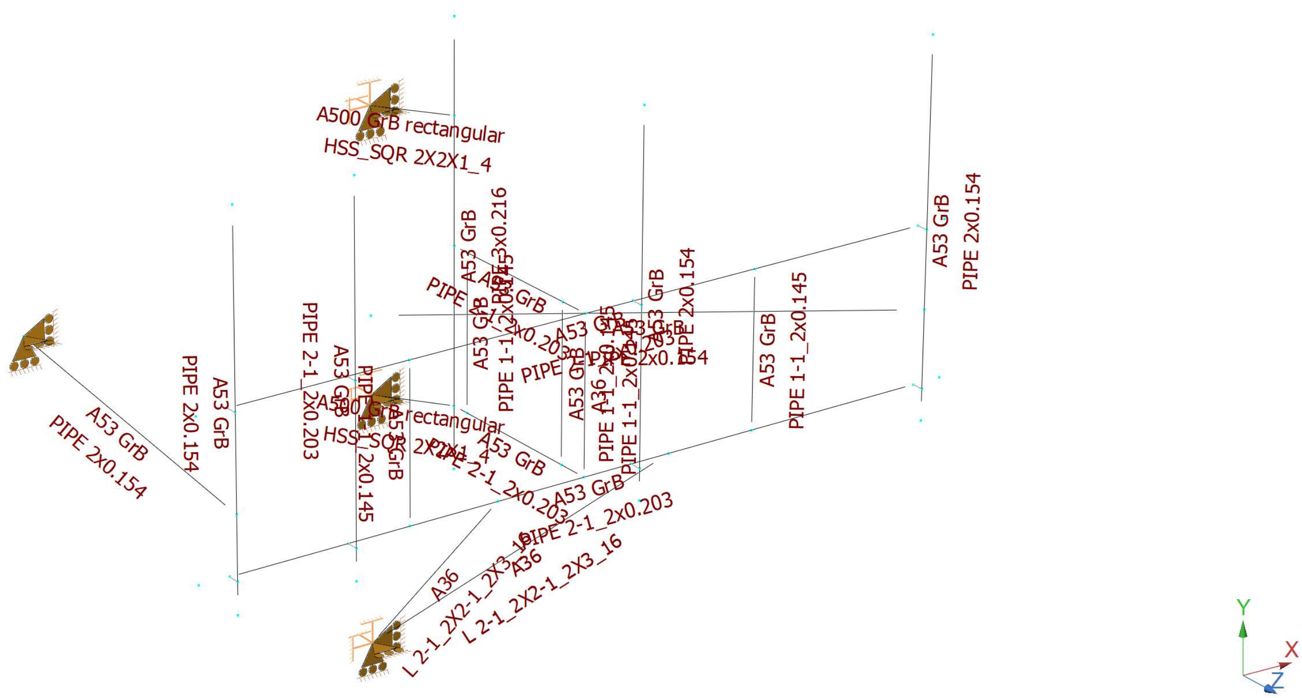
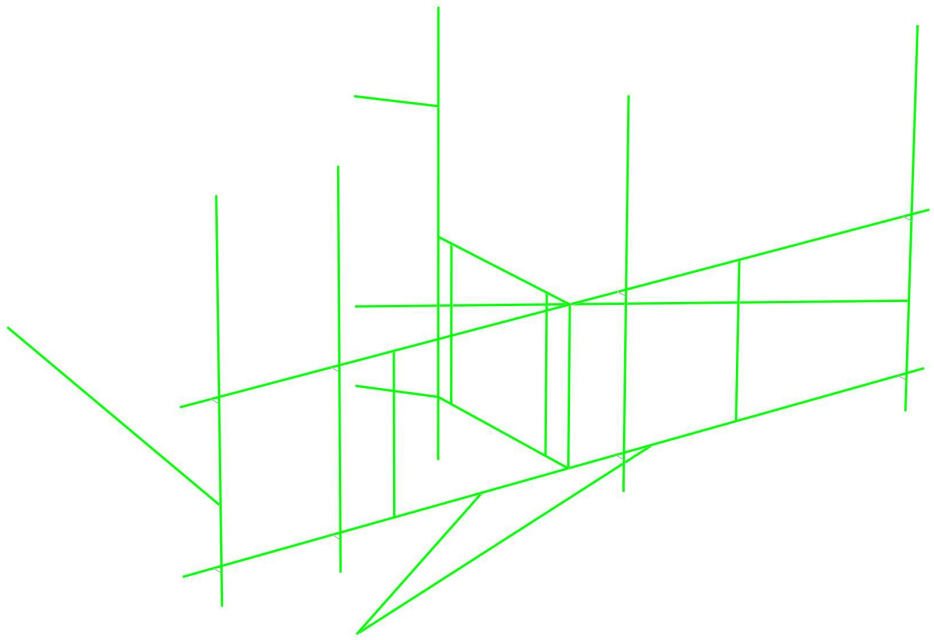
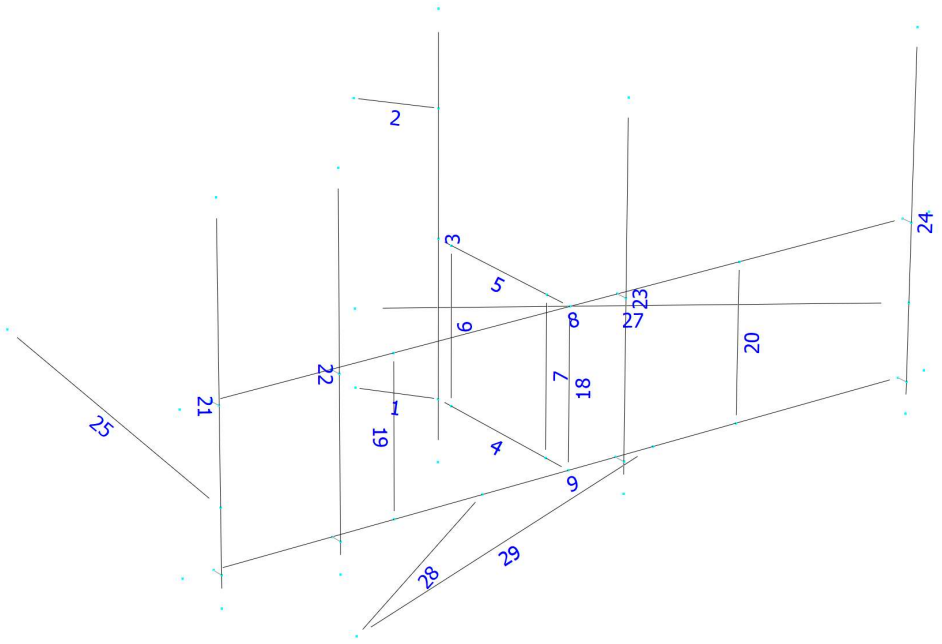


Design status
- Not designed
- Error on design
- Design O.K.
- With warnings

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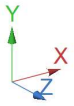
Y
X
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Load data

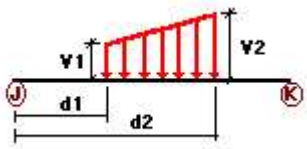
GLOSSARY

Comb : Indicates if load condition is a load combination

Load Conditions

Condition	Description	Comb.	Category
DL	Dead Load	No	DL
Wo	Wind Load (No Ice)	No	WIND
Di	Ice Load	No	LL
Wi	Wind Load (With Ice)	No	WIND

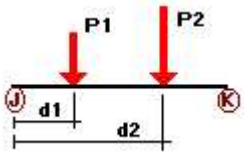
Distributed force on members



Condition	Member	Dir1	Val1 [Kip/ft]	Val2 [Kip/ft]	Dist1 [ft]	%	Dist2 [ft]	%
Wo	3	z	-0.011	-0.011	0.00	No	100.00	Yes
	6	z	-0.006	-0.006	0.00	No	100.00	Yes
	7	z	-0.006	-0.006	0.00	No	100.00	Yes
	8	z	-0.009	-0.009	0.00	No	100.00	Yes
	9	z	-0.009	-0.009	0.00	No	100.00	Yes
	18	z	-0.006	-0.006	0.00	No	100.00	Yes
	19	z	-0.006	-0.006	0.00	No	100.00	Yes
	20	z	-0.006	-0.006	0.00	No	100.00	Yes
	21	z	-0.007	-0.007	0.00	No	100.00	Yes
	23	z	-0.007	-0.007	0.00	No	100.00	Yes
	25	z	-0.007	-0.007	0.00	No	100.00	Yes
	27	z	-0.007	-0.007	0.00	No	100.00	Yes
	28	z	-0.008	-0.008	0.00	No	100.00	Yes
	29	z	-0.008	-0.008	0.00	No	100.00	Yes
Di	1	y	-0.015	-0.015	0.00	No	100.00	Yes
	2	y	-0.015	-0.015	0.00	No	100.00	Yes
	3	y	-0.016	-0.016	0.00	No	100.00	Yes
	4	y	-0.015	-0.015	0.00	No	100.00	Yes
	5	y	-0.015	-0.015	0.00	No	100.00	Yes
	6	y	-0.012	-0.012	0.00	No	100.00	Yes
	7	y	-0.012	-0.012	0.00	No	100.00	Yes
	8	y	-0.015	-0.015	0.00	No	100.00	Yes
	9	y	-0.015	-0.015	0.00	No	100.00	Yes
	18	y	-0.012	-0.012	0.00	No	100.00	Yes

19	y	-0.012	-0.012	0.00	No	100.00	Yes
20	y	-0.012	-0.012	0.00	No	100.00	Yes
21	y	-0.013	-0.013	0.00	No	100.00	Yes
22	y	-0.015	-0.015	0.00	No	100.00	Yes
23	y	-0.013	-0.013	0.00	No	100.00	Yes
24	y	-0.013	-0.013	0.00	No	100.00	Yes
25	y	-0.013	-0.013	0.00	No	100.00	Yes
27	y	-0.013	-0.013	0.00	No	100.00	Yes
28	y	-0.017	-0.017	0.00	No	100.00	Yes
29	y	-0.017	-0.017	0.00	No	100.00	Yes

Concentrated forces on members



Condition	Member	Dir1	Value1 [Kip]	Dist1 [ft]	%
DL	22	y	-0.114	0.50	No
		y	-0.114	5.00	No
		y	-0.098	2.00	No
		y	-0.021	3.50	No
	24	y	-0.017	1.00	No
		y	-0.017	5.00	No
		y	-0.082	2.50	No
Wo	22	z	-0.275	0.50	No
		z	-0.275	5.00	No
		z	-0.028	2.00	No
		z	-0.009	3.50	No
	24	z	-0.089	1.00	No
		z	-0.089	5.00	No
		z	-0.028	2.50	No
Di	22	y	-0.312	0.50	No
		y	-0.312	5.00	No
		y	-0.072	2.00	No
		y	-0.027	3.50	No
	24	y	-0.105	1.00	No
		y	-0.105	5.00	No
		y	-0.069	2.50	No
Wi	22	z	-0.096	0.50	No
		z	-0.096	5.00	No
		z	-0.015	2.00	No
		z	-0.007	3.50	No
	24	z	-0.033	1.00	No
		z	-0.033	5.00	No
		z	-0.015	2.50	No

Self weight multipliers for load conditions

Condition	Description	Self weight multiplier			
		Comb.	MultX	MultY	MultZ
DL	Dead Load	No	0.00	-1.00	0.00
Wo	Wind Load (No Ice)	No	0.00	0.00	0.00
Di	Ice Load	No	0.00	0.00	0.00
Wi	Wind Load (With Ice)	No	0.00	0.00	0.00

Earthquake (Dynamic analysis only)

Condition	a/g	Ang. [Deg]	Damp. [%]
DL	0.00	0.00	0.00
Wo	0.00	0.00	0.00
Di	0.00	0.00	0.00
Wi	0.00	0.00	0.00

Current Date: 8/18/2021 2:43 PM
Units system: English
File name: Z:\Shared\Work2.0\STRUCTURAL DEPARTMENT\ANALYSIS SOFTWARE\RAM Elements\RAM Projects\VERIZON\CT\Northford CT\Rev4\Northford CT (Rev.4) (MOD).retx

Steel Code Check

Report: Summary - Group by member

Load conditions to be included in design :

LC1=1.2DL+1.6Wo
LC2=0.9DL+1.6Wo
LC3=1.2DL+Di+Wi
LC4=1.2DL
LC5=0.9DL

Description	Section	Member	Ctrl Eq.	Ratio	Status	Reference
	HSS_SQR 2X2X1_4	**1**	LC2 at 0.00%	**0.39**	**OK**	Eq. H1-1b
		2	LC2 at 0.00%	0.25	OK	Eq. H1-1b
	L 2-1_2X2-1_2X3_16	**28**	LC3 at 100.00%	**0.63**	**OK**	Eq. H2-1
		29	LC1 at 100.00%	0.29	OK	Eq. H2-1
	PIPE 1-1_2x0.145	**6**	LC1 at 0.00%	0.13	OK	Eq. H1-1b
		7	LC3 at 100.00%	0.14	OK	Eq. H1-1b
		18	LC3 at 100.00%	0.13	OK	Eq. H1-1b
		19	LC3 at 100.00%	**0.93**	**OK**	Eq. H1-1b
		20	LC3 at 100.00%	0.82	OK	Eq. H1-1b
	PIPE 2-1_2x0.203	**4**	LC3 at 10.42%	0.30	OK	Eq. H1-1b
		5	LC1 at 100.00%	0.27	OK	Eq. H1-1b
		8	LC1 at 50.00%	0.79	OK	Eq. H1-1b
		9	LC3 at 38.13%	**0.89**	**OK**	Eq. H1-1b
		22	LC1 at 47.92%	0.65	OK	Eq. H1-1b
	PIPE 2x0.154	**21**	LC2 at 25.00%	**0.55**	**OK**	Eq. H1-1b
		23	LC3 at 50.00%	0.23	OK	Eq. H1-1b
		24	LC3 at 50.00%	0.54	OK	Eq. H1-1b
		25	LC1 at 100.00%	0.39	OK	Eq. H1-1b
		27	LC3 at 0.00%	0.45	OK	Sec. F1
	PIPE 3x0.216	**3**	LC2 at 50.00%	**0.29**	**OK**	Eq. H1-1b

Current Date: 8/18/2021 2:43 PM
Units system: English
File name: Z:\Shared\Work2.0\STRUCTURAL DEPARTMENT\ANALYSIS SOFTWARE\RAM Elements\RAM Projects\VERIZON\CT\Northford CT\Rev4\Northford CT (Rev.4) (MOD).retx

Geometry data

GLOSSARY

Cb22, Cb33	: Moment gradient coefficients
Cm22, Cm33	: Coefficients applied to bending term in interaction formula
d0	: Tapered member section depth at J end of member
DJX	: Rigid end offset distance measured from J node in axis X
DJY	: Rigid end offset distance measured from J node in axis Y
DJZ	: Rigid end offset distance measured from J node in axis Z
DKX	: Rigid end offset distance measured from K node in axis X
DKY	: Rigid end offset distance measured from K node in axis Y
DKZ	: Rigid end offset distance measured from K node in axis Z
dL	: Tapered member section depth at K end of member
Ig factor	: Inertia reduction factor (Effective Inertia/Gross Inertia) for reinforced concrete members
K22	: Effective length factor about axis 2
K33	: Effective length factor about axis 3
L22	: Member length for calculation of axial capacity
L33	: Member length for calculation of axial capacity
LB pos	: Lateral unbraced length of the compression flange in the positive side of local axis 2
LB neg	: Lateral unbraced length of the compression flange in the negative side of local axis 2
RX	: Rotation about X
RY	: Rotation about Y
RZ	: Rotation about Z
TO	: 1 = Tension only member 0 = Normal member
TX	: Translation in X
TY	: Translation in Y
TZ	: Translation in Z

Nodes

Node	X [ft]	Y [ft]	Z [ft]	Rigid Floor
1	0.00	0.00	0.00	0
2	6.50	0.00	0.00	0
3	-6.50	0.00	0.00	0
4	-0.75	0.00	-4.25	0
5	0.00	0.00	-3.21	0
6	0.00	0.00	-2.88	0
7	0.00	0.00	-0.55	0
8	0.00	2.50	0.00	0
9	6.50	2.50	0.00	0
10	-6.50	2.50	0.00	0
12	0.00	2.50	-3.21	0
13	0.00	2.50	-2.88	0
14	0.00	2.50	-0.55	0
15	-0.75	4.50	-4.25	0
16	0.00	4.50	-3.21	0
17	0.00	6.00	-3.21	0
18	0.00	-1.00	-3.21	0
19	-6.00	0.00	0.00	0
20	-6.00	2.50	0.00	0
21	6.00	0.00	0.00	0
22	6.00	2.50	0.00	0

23	0.833	0.00	0.00	0
24	0.833	2.50	0.00	0
25	-4.042	0.00	0.00	0
26	-4.042	2.50	0.00	0
27	6.00	0.00	0.20	0
28	6.00	2.50	0.20	0
29	0.833	0.00	0.20	0
30	0.833	2.50	0.20	0
31	-4.042	0.00	0.20	0
32	-4.042	2.50	0.20	0
33	-6.00	0.00	0.20	0
34	-6.00	2.50	0.20	0
35	3.00	2.50	0.00	0
36	3.00	0.00	0.00	0
37	-3.00	2.50	0.00	0
38	-3.00	0.00	0.00	0
39	0.833	-0.50	0.20	0
40	-4.042	-0.50	0.20	0
41	-6.00	-0.50	0.20	0
42	6.00	-0.50	0.20	0
43	-6.00	5.50	0.20	0
44	-4.042	5.50	0.20	0
45	0.833	5.50	0.20	0
46	6.00	5.50	0.20	0
47	-6.00	1.00	0.20	0
48	-5.00	1.00	-7.00	0
51	-0.75	1.25	-4.25	0
52	6.00	1.25	0.20	0
53	-0.75	-4.00	-4.25	0
54	-1.50	0.00	0.00	0
55	1.50	0.00	0.00	0

Restraints

Node	TX	TY	TZ	RX	RY	RZ
4	1	1	1	1	1	1
15	1	1	1	1	1	1
48	1	1	1	0	0	0
53	1	1	1	1	1	1

Members

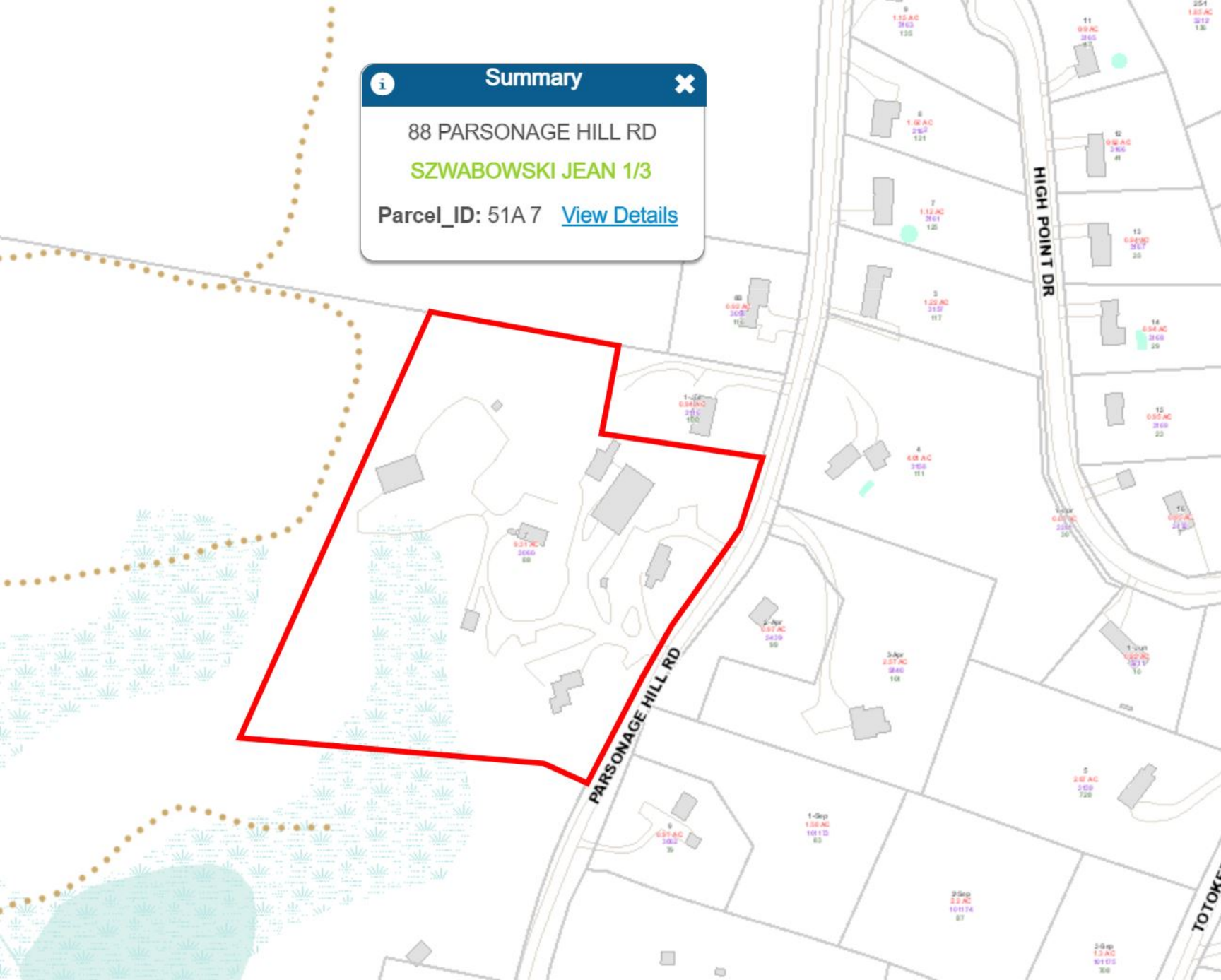
Member	NJ	NK	Description	Section	Material	d0 [in]	dL [in]	lg factor
1	4	5		HSS_SQR 2X2X1_4	A500 GrB rectangular	0.00	0.00	0.00
2	15	16		HSS_SQR 2X2X1_4	A500 GrB rectangular	0.00	0.00	0.00
3	18	17		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
4	5	1		PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
5	12	8		PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
6	13	6		PIPE 1-1_2x0.145	A53 GrB	0.00	0.00	0.00
7	14	7		PIPE 1-1_2x0.145	A53 GrB	0.00	0.00	0.00

8	10	9	PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
9	3	2	PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
18	8	1	PIPE 1-1_2x0.145	A36	0.00	0.00	0.00
19	37	38	PIPE 1-1_2x0.145	A53 GrB	0.00	0.00	0.00
20	35	36	PIPE 1-1_2x0.145	A53 GrB	0.00	0.00	0.00
21	41	43	PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
22	44	40	PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
23	45	39	PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
24	46	42	PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
25	48	47	PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
27	52	51	PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
28	54	53	L 2-1_2X2-1_2X3_16	A36	0.00	0.00	0.00
29	53	55	L 2-1_2X2-1_2X3_16	A36	0.00	0.00	0.00

Orientation of local axes

Member	Rotation [Deg]	Axes23	NX	NY	NZ
21	315.00	0	0.00	0.00	0.00
22	315.00	0	0.00	0.00	0.00
23	315.00	0	0.00	0.00	0.00
24	315.00	0	0.00	0.00	0.00
28	180.00	0	0.00	0.00	0.00
29	180.00	0	0.00	0.00	0.00

ATTACHMENT 5


Summary
88 PARSONAGE HILL RD
SZWABOWSKI JEAN 1/3
Parcel_ID: 51A 7 View Details
HIGH POINT DR
PARSONAGE HILL RD

88 PARSONAGE HILL RD

Sales | Print | Field Card | Map It

Location	88 PARSONAGE HILL RD	**Mblu**	51/A 7/ / /
Acct#	002953	**Owner**	SZWABOWSKI JEAN 1/3
Assessment	$885,600	**Appraisal**	$1,279,900
PID	3060	**Building Count**	4

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2020	$713,000	$566,900	$1,279,900

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2020	$488,800	$396,800	$885,600

Owner of Record

Owner	SZWABOWSKI JEAN 1/3	**Sale Price**	$90,000
Co-Owner	OCHENKOWSKI J J JR 1/3 & K W 1/3 EACH	**Certificate**	
Address	84 PARSONAGE HL RD NORTHFORD, CT 06472-1445	**Book & Page**	0429/1132
		Sale Date	12/23/2009

Ownership History

ATTACHMENT 6

UNITED STATES POSTAL SERVICE®

NORTHFORD

Certificate of Mailing — Firm

Name and Address of Sender	TOTAL NO. of Pieces Listed by Sender	TOTAL NO. of Pieces Received at Post Office™	Affix Stamp Here ***Postmark with Date of Receipt.***
Kenneth C. Baldwin, Esq. Robinson & Cole LLP 280 Trumbull Street Hartford, CT 06103		3	neopost 12/08/2021 US POSTAGE $002.99 ZIP 06103 041L12203937
	Postmaster, per *(name of receiving employee)*	10	

USPS® Tracking Number / Firm-specific Identifier	Address (Name, Street, City, State, and ZIP Code™)	Postage	Fee	Special Handling	Parcel Airlift
1.	Michael T. Paulhus, Town Manager Town of North Branford 909 Foxon Road North Branford, CT 06471				
2.	Eric Knapp, Town Planner Town of North Branford 909 Foxon Road North Branford, CT 06471				
3.	Ochenkowski Towers LLC 88 Parsonage Hill Road North Branford, CT 06471				
4.					
5.					
6.					

OLD STATE HOUSE STATION 06106 DEC 08 2021 USPS